

SECTION 200.00 – PREPARATION AND SUBMITTAL OF REPORTS

SECTION 210.00 – MATERIALS PHASE REPORTS

210.01 Requirements. A series of Materials Phase Reports is required for development of highway projects. Each report represents a different phase of project development. Following is a listing of these reports.

- Phase I - Geologic Reconnaissance Report
- Phase II - Soils Investigation
- Phase III Pavement Estimating Report
- Phase IV - Foundation Investigation
- Phase V - Special Provisions
- Phases I (R) Rehabilitation for Pavement Report (refer to [Section 225.00](#))

In addition, for corridor or location studies on new alignments, a geologic reconnaissance report is typically prepared well in advance of Phase I.

A major emphasis is the reduction of pavement deficiencies. From a project development standpoint, pavement rehabilitation projects are commonly referred to as “Circle M” projects. “Circle M” is a project development designation for a project the main purpose of which is to improve the cracking and rutting indexes of the roadway; i.e. pavement rehabilitation. Projects meeting certain criteria (\$/ln-mi, surface work only, etc.) are given the Circle M designation; however, the Circle M designation in and of itself does not represent a design standard. The Circle M designation does not justify the omission of any steps in the design process, including the submission and review of Materials Reports.

1R (Pavement Rehabilitation) is the minimum design standard required for a project to qualify for federal funding. The 1R standard requires that a project be designed for a minimum of an 8 year design life. The [Design Manual](#) states that the primary goal of the 1R standard is to rehabilitate pavements where a maintenance treatment would not be cost effective, but has not yet deteriorated to the point of needing major treatment or reconstruction. All projects with a 1R Design Standard are designated Circle M projects, but the Circle M designation does not necessarily imply a 1R Design Standard. State funded Circle M projects not on the NHS are not required to meet the 1R Design Standard.

A project may also require guardrail, shoulder work, etc. Such work must be paid for from a separate funding category than that receiving the Circle M designation. Otherwise, the project no longer qualifies as a Circle M.

The 3R (Resurfacing, Restoration, and Rehabilitation) design standards (NHS and Interstate) are intended to extend the service life of the existing highway and, at the same time, improve highway safety by making selective improvements to highway geometry and roadside features. A project

meeting the 3R NHS standard can have as little as an 8 year design life, but any less than a 20 year design life must be justified.

The State Design Standards cover federally funded projects not on the NHS. Minimum design standards for state funded projects not on the NHS are not identified for use on a statewide basis. Appropriate design standards for state funded projects not on the NHS are as determined by the District or on a project specific basis.

Therefore, the requirements for submittal and approval of Materials Phase Reports are as follows:

HQ approved Materials Phase Reports are required for all federally funded projects including those not on the NHS (those not requiring FHWA oversight).

State funded projects which are on the NHS require the same level of standards, design, and review as federally funded projects, therefore, HQ Materials concurrence with the Materials Phase Reports for these projects is required.

The State Design Criteria for non-NHS routes is a 20 year design life for reconstruction and 10 years for rehabilitation. Therefore, HQ Materials concurrence with the Materials Reports for these projects is appropriate, but not required when they are State funded. As stated above, HQ approval of federally funded projects not on the NHS is required. State funded minor rehabilitation projects not on the NHS do not necessitate HQ concurrence.

All Phase Reports should be submitted to HQ Materials so that copies of all Phase Reports can be stored in and distributed from one central location.

The HQ Materials policy is to approve Materials Phase Reports for federally funded projects and comment only on state funded projects not on the NHS. The elimination of any Materials Phase Report should be evaluated and justified on a case by case basis.

The HQ Materials Section has the responsibility to review and comment on every report, regardless of funding source. In the case of state funded projects not on the NHS, the Phase Reports do not require HQ approval, and HQ Materials comments should be taken as suggestions rather than as requirements. In this situation, at the discretion of the District, a re-submittal of the report addressing our comments is not required.

All structural elements of the roadway should be designed and all minimums and maximums provided in the Materials Manual should be adhered to regardless of the source of funding. The exception to this rule is defined by [Section 540.03.11](#), which, for projects such as railroad crossings, allows the pavement structure to meet or exceed that of the surrounding roadway.

Further information, such as which types of construction/ reconstruction/ rehabilitation/ maintenance procedures are eligible for specific projects (with respect to funding program), is available upon request. It is not the purpose of this manual to cover such policies.

The ITD Materials Section recognizes the need for the prompt review and return of comments on Materials Reports and Design Reviews.

Guidance on development of Phase Reports is included in [Table 200.01-1](#).

TABLE 200.01-1

PHASE REPORTS FOR WORK CATEGORIES

WORK CATEGORIES *		PHASE REPORTS						
		I	LCCA	II	III	IV	V	Geotechnical
Pavement (Roadway)								
	Reconstruction	X	X	X	X		X	
	Rehabilitation (Pvmt Rehab)	X*****	X		X		X	
	New Construction	X	X	X	X		X	
	New Alignment	X	X	X	X		X	
	Improved Maintenance				X		X	
	Emergency Relief			X	X		X	X
Structures								
	New / Reconstruction **	X		X	X	X	X	
	Structure Rehabilitation ***					X	X	
	Deck Rehabilitation						X	
	Improved Maintenance						X	
Geotechnical								
	Special Situation; Landslide, Slope Stability, Large Embankment, etc.							X
	Rockfall Mitigation						X	X
	Retaining Structure							
	Major					X	X	
	Minor; <10' high			X			X	
	Railroad Crossing			X	X		X	
Bike Path / Enhancement ****			X	X		X		
CMAQ								
	New Construction			X	X		X	
	Improved Maintenance				X		X	
	Maintenance							
		none						

* A project may include more than one work category. As such, appropriate reports should be prepared to ensure that all issues are addressed. **Appropriate reports apply on ER projects.** HQ concurrence should be obtained on all report waivers.

** A Life Cycle Cost Analysis should be prepared for structure projects with greater than 500' approaches. The Life Cycle Cost Analysis should address pavement type and/or pavement rehabilitation options. For a new structure on the same alignment as the existing structure with less than 500' approaches (500' per approach), a waiver of the Phase I report should be requested.

*** A Phase IV report is required only if rehabilitation of a foundation is involved.

**** Refer to [Design Manual](#) for addressing specialized inspection (Idaho Association of Building Officials, etc.)

***** Phase I (R) Rehabilitation for Pavement Report

In regards to projects for which the main purpose is major widening to add lanes, the ITD Life Cycle Cost Analysis computer program includes a Widen and Overlay subroutine for evaluating this option. On such projects, the condition of the existing roadway should be evaluated. The widen portion of the project should be evaluated as new construction and the existing pavement should be evaluated for new/reconstruction or rehabilitation.

Submit Phases I through V reports at the proper time and in the proper sequence. The Project Activity Flow Chart ([Design Manual, Figure 3-1a](#)) and Project Development Checklist ([Design Manual, Figure 3-1b](#)) indicates the relationship of the individual phase reports to the other elements of project development. If alignments are established, phase reports can be initiated earlier than the network shows. Only the Phase I report can be completed prior to Preliminary Design Review and is intended to be attached to the Concept Report.

Phase I reports or abbreviated Phase I reports are normally needed on all projects. **Elimination of the Phase I report must be approved by the Headquarters Materials Section.** For projects involving new construction, reconstruction, or rehabilitation of pavement, [Section 540.00](#), Pavement Structure Analysis and [Section 541.00](#), Life Cycle Cost Analysis alternatives will be incorporated into the Phase I report.

Preliminary Phases II and IV reports may be prepared to provide guidance to designers before the project concept is finalized. These reports typically document partial investigations and are retained as part of the file. A working relationship should be established with the designer to determine the amount of preliminary information that can be made available prior to publishing the official reports.

Manual [Sections 220.00](#) through [260.00](#) present the format for the individual phase reports. These sections are to be used as guidelines and checklists for preparation of the reports.

As a minimum, the report must address all subjects in the manual sections. This will assure users and reviewers that no subject was overlooked. If a subject is not applicable to a particular project, indicate the reason(s); do not use N/A (not applicable). Include a Table of Contents in each report. Abbreviated Phase I and II reports may be appropriate for types of projects where addressing all subjects is of limited value.

Complete, well written reports, with supporting data included, normally take less time to review, thus shortening the turn around time. If the reviewer has to guess how the conclusions were developed, the review time can increase significantly.

210.01.01 Materials Reports Prepared by the District. The District Materials Engineer will submit four copies of all phase reports (6 copies for Phase IV reports) to the Headquarters Materials Engineer for review. After resolution of differences with the districts, an approved, or joint, materials report will be issued by the Headquarters Materials Section. When requested by the districts, portions of reports may be prepared by the Headquarters Materials Section and transmitted to the District Materials Engineer for review before issuing the joint report.

Distribution of the reports and/or transmittal letters are left up to the District. However, it is suggested a copy of the transmittal letter and report be retained by the District Materials Engineer and copies of the transmittal letter be routed to the DE, ADE, PDE, and any others deemed necessary.

Seal coat and stockpile project reports and some State funded project reports, as outlined above, do not require a review. Typically, the report and transmittal letter are addressed to the Project Development Engineer with a “courtesy” copy sent to the Materials Engineer. Unusual specifications

or designs should be discussed with Headquarters Materials by telephone, e-mail, or at a joint review in the district. If Headquarters Materials has questions or comments on routine projects after reviewing the report, the questions or comments will be sent to the District Materials Engineer. All reports that are submitted to Headquarters Materials, regardless of type or whether approval is required, will be reviewed and returned with comments. Following the review, a copy of the joint Materials Report is transmitted by Headquarters Materials to the Roadway Design Engineer with the original to the District Materials Engineer.

210.02 Distribution of Joint Materials Reports. Joint materials reports are addressed and distributed as follows by HQ Materials:

- Phases I, II, III, and V

A report with cover letter addressed to District Materials Engineer

Copy of cover letter only to Assistant District Engineer.

Copies with report to the Roadway Design Engineer, District Project Development Engineer, and FHWA (full oversight projects only).

- Phase IV

A report with cover letter addressed to Bridge Design Section.

Copy of cover letter only to the Assistant District Engineer

Copies with report to Roadway Design Engineer, District Project Development Engineer, District Materials Engineer, and FHWA.

Joint Phase IV reports for buildings are addressed to the Facilities Management Bureau Chief.

210.03 Draft Reports Prepared by the District. To expedite review on complex projects, phase reports (particularly Phases I, II, and IV) may be submitted to the Headquarters Materials Section in draft form. The Headquarters Materials Section will review and return the draft report with comments to the district. Following necessary revisions, the final phase reports are then prepared and submitted as outlined above. Draft reports are typically unsigned, often incomplete, and will not be included in the project file. They should be clearly marked, or stamped, “DRAFT” to avoid confusion with later submittals. Draft reports may also be e-mailed to the Headquarters Materials Project Development Engineer.

On projects of average complexity, there is little need to prepare draft reports. Therefore, the use of draft reports should be limited to those projects of above average complexity and where the review process will be clearly enhanced by their submittal. Questions arising on these types of projects should be addressed to the individuals in the Headquarters Materials Section with the expertise to assist.

210.04 Revisions to Reports Prepared by the District. When revisions to the joint materials

report become necessary, the revisions will be discussed with the district by telephone, e-mail, and/or in a field review. After differences are resolved, the Headquarters Materials Section prepares full page submittals, with the changes noted by an asterisk and explained in a cover letter. This will permit full page deletions and additions to the existing report.

Revisions and additions may also be made by addendum to a previously approved report. Following Headquarters Materials Section review and approval or revision, addenda are transmitted as outlined in [Section 210.02](#). The addenda shall be attached to the front of and made a part of the joint report.

210.05 Consultant Reports. Consultant-prepared phase reports follow the same procedures as those prepared by the district. “Acrobat” format is suggested for electronic review of consultant reports. ITD review of consultant materials reports is necessary for the purpose of approval or concurrence as described previously in this chapter. This section covers the additional issues inherent to consultant reports.

Except for the Phase V report, consultant-prepared Materials Phase Reports may be submitted in the consultant’s standard format. The format used by the districts for each Phase Report, as shown in this manual shall serve as a checklist for the consultant to ensure that significant conditions are considered and covered in the report. The consultant is encouraged to use a format that is similar to the Materials Manual to allow more efficient review by ITD. However, the format for the specifications in the Phase V Special Provision report shall be in accordance with the standard format used by ITD.

Consultants are advised to anticipate the time and effort necessary for draft reviews and possible resubmittal of Materials Phase Reports in their scope of services. Some projects require ITD Materials review of consultant draft submittals prior to publication to the designer.

On highly complex and unusual projects, preliminary report(s) to summarize partial investigation are appropriate. Such reports are for ITD Materials review only and are for the purpose of facilitating ongoing investigation rather than design. An ITD Materials draft review of these prior to final stamp and signature by the consultant should be performed.

Consultants submit five (5) stamped and signed copies of each report to the District Project Development Section.

District Project Development Section transmits all copies to the District Materials Engineer. District Materials reviews the report and resolves differences with the consultant. Four (4) copies (5 copies for Phase IV reports) are then transmitted to the Headquarters Materials Section with the District Materials Engineer's concurrence and/or comments clearly covered in the transmittal letter. One copy is kept on file by the District Materials Engineer.

The Headquarters Materials Section reviews the reports and transmits one (1) copy to District Materials (Bridge Design Section for Phase IV reports) as an approved materials report or as approved pending receipt of an addendum addressing comments. Reports which are not approved are transmitted to District Materials, with recommended changes and additions, for return to the consultant. The consultant must receive copies of the reports that have been marked up with comments by both the district and headquarters reviewers as well as comments covered in transmittal letters so corrections can be made. Where recommended changes are minor, i.e., additional information or justification for recommendations, the Headquarters Materials Section may approve the report subject to receipt of an addendum addressing comments.

Orderly development of the Materials Phase Reports is essential to project development and review. Consultant-developed phase reports are to be submitted in accordance with the Design Manual requirements. Multiple phase reports will not be accepted as a package. To avoid delays, it is essential that these reports be developed quickly and individually, and reviewed quickly but thoroughly as each phase is completed. Draft reports will be submitted to and reviewed by the District Materials Engineer and returned to the consultant with comments or forwarded to the Headquarters Materials Section by the district depending on the situation.

The District and, if requested by the District, Headquarters Materials personnel will work closely with each consultant from the inception of the project. Consultants should contact the District Materials Engineers and review with them the project geology and investigation requirements prior to developing their scope of services. An exploration plan shall be reviewed with District Materials and/or Headquarters Materials Sections prior to beginning field exploration.

A consultant report is considered to be a final product as purchased from the consultant by ITD. Consultant reports are signed and sealed by a Professional Engineer licensed in the State of Idaho; however, become the property of ITD upon approval. Consultant reports should make recommendations within the context of ITD requirements. ITD Materials reserves the right to make minor modifications to the recommendations of the report by cover letter.

Consultants are expected to perform their own internal reviews equal in effort to that which would be provided to any other client.

Draft submittals, subsequent to internal consultant review, for local roads projects of average complexity may be appropriate in the interest of timeliness of approvals.

The purpose of reviewing Materials Reports prepared by the consultants is to ensure their completeness and that they comply with the state standard and common practices of design and construction of roadways and structures. The review and approval of consultants' reports by the state will not release the consultant from their responsibility for their recommendations and the accuracy of the content of the reports.

210.06 Professional Responsibility. The requirements provided in [Section 200.00](#) should be considered as the minimum required and is intended as a guide to ensure a thorough analysis of the project. It is also the intent of this chapter to provide uniform and consistent materials reports statewide.

These requirements are not intended as a substitute for experience and engineering judgment. The author must ensure the accuracy of the information and that an adequate investigation has been performed.

ITD Materials recommendations are intended to address completeness and to ensure reports and projects meet the appropriate requirements. All Materials comments are to be addressed to the satisfaction of the District Materials Engineers and Headquarters Materials.

SECTION 220.00 – PHASE I (G) GEOLOGICAL RECONNAISSANCE REPORT

PHASE I (R) REHABILITATION FOR PAVEMENT REPORT

The purpose of the Phase I Materials Report and Geologic Reconnaissance is for geologic reconnaissance of corridors and to provide the designer with general information that will assist in the preparation of the design concept report. For pavement rehabilitation, the Phase I (R) report consists of pavement design.

For new alignment and major realignment projects, materials information in the Materials Phase I Geological Reconnaissance Report is developed to the extent needed to identify the geologic conditions and constraints which may influence the choice of alignment and to identify the pavement type. Once a tentative alignment is selected then detailed geologic information regarding the proposed alignment, and preliminary and working design criteria are developed during the course of the Phase II soils investigation. The designer should be aware that information developed in the Phase II soils investigation may generate changes in the alignment.

The following report outline shall be used for both Phase I investigations and geologic reconnaissance reports. For corridor studies, the recommendations sections may be brief or presented in general terms. The Phase I report would contain a relatively brief topography and geology section with an expanded site specific geologic constraints and recommendations section. Adequate maps and exhibits, such as a vicinity sketch and geologic map, must be included. Reference any relevant reports or previous investigations.

The Pavement Structure Analysis, [Section 540.00](#), and Life Cycle Cost Analysis, [Section 541.03](#), shall be attached and submitted with the Phase I report. The Phase I Report, the Engineering Report, and the Life Cycle Cost Analysis will all become attachments to the Concept Report. A Life Cycle Cost Analysis program is available from the Headquarters Materials Section or through the Materials web site.

On projects involving widening, minor relocation (curve flattening, etc.), the designer needs preliminary materials design criteria to develop the concept report. An abbreviated Phase I report shall be submitted on these projects. On projects primarily consisting of pavement rehabilitation or pavement reconstruction, a Phase I (R) report shall be submitted (refer to [Section 225.00](#)).

In preparing the abbreviated Phase I report, geologic description may be omitted along with geologic mapping. The report should consist of an Introduction ([220.01](#)), sections on Surface Water ([220.04](#)), Groundwater ([220.05](#)), Geologic Constraints or Hazards ([220.06](#)) which are appropriate, and Recommendations ([220.07](#)). Reference relevant reports or previous investigations.

220.01 Introduction. Begin the report with a statement of purpose and scope of investigation. Describe the area covered, length of corridor, proposed alignment length, corridor width, termini, and route number. Indicate scope of the project (new alignment, realignment, etc.).

220.02 Conclusions. State conclusions regarding the relative geologic feasibility of proposed alignment(s). Indicate major geologic conditions and constraints influencing feasibility of the alignment(s). Refer to subsequent sections in the report where constraints are discussed. Include general conclusions regarding the choice of alignment(s) or changes in alignment(s). Refer to maps where appropriate.

In large reports, this section may be replaced by a summary, which briefly states the results of the investigation. Typical summaries do not exceed 1 to 1 ½ pages.

220.03 Topography and Geology.

- Topography

Provide information on the relief of the area under study, existing ground slopes, elevation range, valley or drainage width, and grade. Indicate if alignments parallel or cross topographic features, i.e., ridges, stream valleys, etc.

- Geomorphology and Stratigraphy

Describe the land forms which influence any new alignment(s), and discuss the geologic units which will be encountered. Present the stratigraphic section(s) and the influence of stratigraphy on the alignment(s) for any grade changes. Refer to mapping.

- Geologic Structure

Describe the structure of the geologic units and its influence on any new alignment(s). Include discussions of faulting, joints, bedding, foliation, attitudes, etc. Include structural attitudes on the geologic map.

- Soils and Vegetation

Describe the distribution and thickness of soil units including top soil. Indicate types and distribution of vegetation in the study area. Include land use as related to soil and vegetation.

220.04 Surface Water. Describe the surface drainage pattern and its influence on roadway location. Include information on high water, erosion, deposition, influence of lithology, and geologic structure on surface drainage patterns, etc.

For to-be-constructed bridge locations over a channel, obtain representative samples near the streambank and evaluate for sizing of riprap material and design of erosion control geotextile. When entering a channel with equipment, the conditions of U.S. Army Corps of Engineers 404 Permit Requirements may apply and an Idaho Department of Water Resources Stream Alteration Permit or written approval may be required.

State the D_{50} and the D_{90} sizes of the streambed material. Also, state the D_{15} , D_{50} , and D_{85} sizes of the in-situ material at the abutment or channel side slope locations.

D_{xx} is the material size for which xx% by weight of the particles are smaller.

220.05 Groundwater. Cover the occurrence and distribution of subsurface water. Provide estimates of depth to groundwater. Cite observations which provide evidence for depth estimates. Include information regarding current groundwater uses. Provide measurements and yield data on existing wells and springs. Describe the influence of geology on groundwater, and the influence of groundwater on the proposed highway construction.

220.06 Geologic Constraints. Outline the constraints or hazards presented to highway construction by geologic conditions.

- Seismic Risk

Discuss past and future earthquake occurrence in the project region. Potential hazards from seismic activity include fault rupture, ground shaking, slope failure, settlement, and liquefaction. Discuss the potential influence of these factors on the proposed construction. Indicate locations of potential problem areas. Estimate the peak firm ground acceleration coefficient anticipated (10% chance of exceedence in 50 years) by using [Figure 240.05.08-2](#) in this manual.

- Faults

Note location(s) of active and potentially active faults in the project vicinity. Discuss the influence of faults and shear zones (active or inactive) on proposed construction. Faulting typically will influence slope stability and groundwater flow.

- Landslides

Indicate presence and location of existing landslides, and their influence on highway construction. Discuss possible mitigation techniques; avoidance, stabilization, removal, etc. Also, indicate areas of potential instability, including talus deposits.

- Water

Discuss potential for flooding and indicate where special construction techniques will be needed, i.e., drainage, erosion protection, etc. Estimate the effect of construction on groundwater flow and indicate possible ways to mitigate adverse effects.

- Settlement and Embankment Foundation

Describe subsurface conditions below proposed embankments and indicate locations where significant settlement of embankments may be expected. Identify relatively deep, loose, or soft soil deposits that indicate potential embankment foundation instability.

- Geologic Structure of In-Situ Rock Formations

Indicate influence of bedding, foliation, joint attitudes, and contacts on construction, i.e., adverse dip or joint intersections may dictate rock slope angles or require support.

- Highway Construction Materials

Discuss the availability of borrow sources, aggregate sources, and waste sites. Include environmental constraints to developing sources or waste sites, i.e., wetlands, zoning, etc. Include both existing ITD controlled sources and contractor furnished sources in the area.

220.07 Recommendations. Even in very early stages of project development, preliminary design criteria are needed for preliminary cost estimates and comparison of alternatives. In corridor studies, these design criteria will be largely qualitative, and most of the recommendations will be contained in the preceding sections. In Phase I, a tentative alignment is established and more quantitative, but preliminary design criteria are still needed. Indicate locations where special and/or analyses appear warranted.

- Slopes and Embankments

Preliminary recommendations should include applicability of standard cut and fill slopes, and locations where slopes will be governed by geologic conditions (stratigraphy, structure, potential sliding). Indicate areas where sidehill embankments and embankment foundations need special treatment. Include recommended changes in alignment needed to accommodate geologic constraints. Identify potential rockfall problem locations.

- Structures

Indicate types of structure and locations where they will likely be required, if any. Note existing structures and comment on condition.

- Drainage

Provide locations where subdrainage and surface water interception or diversion will likely be necessary.

- Shrink/Swell

Provide estimates for shrink and swell factors for geologic units or groups of materials to be encountered in excavation. These estimates, in conjunction with the local stratigraphic sequence, will provide data for preliminary earthwork analysis.

- Tentative Ballast

Preliminary ballast thickness estimates may be based on the general materials types expected to occur at subgrade. A limited number of R-value tests are performed for typical expected subgrade soils. Make use of adjacent project data where applicable.

- Tentative Material Sources

Indicate the existing materials sources, both ITD controlled and contractor furnished sources, in the project vicinity and the probable material produced. The location of potential sources should be presented as well as a description of probable materials encountered. Give consideration to access and environmental aspects of source development. Use the legal description and a descriptive location in relation to the project.

Typically, ITD will not develop sources for individual projects, rather will put the burden on the contractor to find material for the project. However, the Tentative Materials Sources information provided in this section will give the designer an idea of how to establish materials costs for the project.

220.08 Geologic Mapping. The scale of geologic mapping is left to the preparer. However, the scale should be large enough to show adequate detail. For filing ease, maps should be prepared on sheet sizes which are multiples of 215 mm × 280 mm (8 1/2" × 11"), i.e., 280 mm × 430 mm (11" × 17"), 430 mm × 560 mm (17" × 22"), 560 mm × 860 mm (22" × 34"). Individual sheets should be no larger than 560 mm × 860 mm, or standard sheets.

A topographic map base is suggested. The geology, structure, and features (such as landslides and high groundwater areas) may be plotted directly on the base map or developed on an overlay or series of overlays. Screened base mapping is often an effective presentation.

The degree of geologic complexity and scope of the project will dictate the detail required. On relatively low relief, geologically simple projects, a standard county map may provide an adequate base (although a larger scale may be needed).

On more complex projects, large scale topography may be needed as a base and additional presentations such as slope maps, groundwater maps, geologic hazards, geologic structure, etc., may be needed.

220.09 References. The following are possible sources of geologic information which may be of use in preparing geologic reports and maps. In this section, provide a list of references used while preparing the report.

- USGS quad sheets, open file reports, professional papers, etc.
- US Bureau of Reclamation reports
- Aerial Photo Coverage
- University-developed geologic studies
- Soil Conservation Service soil mapping
- Bureau of Land Management
- US Forest Service
- Department of Energy
- Idaho Geological Survey
- US Bureau of Mines
- Annual Engineering Geology and Soils Engineering Symposia

With the exception of aerial photos in the Roadway Design Section, limited geologic mapping, ERTS imagery, and seismic risk data in the Materials Section, geologic references are not available through Headquarters.

SECTION 225.00 – MATERIALS PHASE I (R) REHABILITATION FOR PAVEMENT REPORT

A Phase I (R) Rehabilitation for Pavement Report is appropriate for projects designated as pavement rehabilitation projects, including but not limited to pavement overlays, CRABS, mill and inlay, cold in place recycle and hot in place recycle. The level of field work required, such as pavement condition information, preliminary pavement drilling and/or test pits, and FWD testing will be the same as for a full Phase II report and is presented in greater detail in the following sections. The Phase I (R) Rehabilitation for Pavement Report is developed at the concept stage and repetition/re-review of essentially the same information and report during the design phase is not necessary unless changes are necessary. As previously described, an Abbreviated Phase I with full Phase II, III, and V reports is considered appropriate for widening, minor relocation and reconstruction projects.

225.01 Report Format. The following is considered to be an appropriate format for a Phase I (R) Report for pavement rehabilitation projects. In addition, all applicable sections from the Abbreviated Phase I and Phase II report format should be addressed in the Phase I (R) Report. The information corresponding to some sections may be omitted as repetitive or not relevant for pavement rehabilitation projects without explanation.

225.01.01 Introduction. Describe the characteristics of the roadway covering location, materials history, and current condition. Include rutting, cracking, and roughness indices. Briefly state or describe the roadway characteristics such as grade, approximate super elevations, shape condition of the roadway crown, etc. Identify any primary usage and traffic characteristics that are anticipated to affect project design in ways other than for analysis purposes.

225.01.02 Evaluation. Provide detailed description of roadway characteristics such as grade, approximate super elevations, shape condition of the roadway crown, etc. Provide additional description of cracking, rutting, roughness, edge breaking, etc. as needed.

Discuss resultant information from [Section 530.00](#), Pavement Rehabilitation Design including discussion of information from [Section 540.00](#), Pavement Structure Analysis as appropriate. Particular attention should be given to existing pavement thickness, truck ADT, and pavement subsurface drainage.

Provide explanation(s) of any primary usage and traffic characteristics that are anticipated to affect project design in ways other than for analysis purposes, as needed.

Identify any geologic or environmental features that may pose a constraint on the project. Such features may include, but are not limited to, areas presenting potential rockfall hazard, landslides, or obvious wetlands.

Briefly discuss or identify available materials sources in the area of the project. Provide a brief description of anticipated materials quality.

Identify any structures that may exist on the project and comment on condition.

Identify any pipes that may exist on the project and comment on condition.

Identify any roadway locations where sub-subgrading, or full reconstruction will be needed. Address compaction and subsurface drainage.

Discuss pavement geotextile or any other non-usual products or procedures that are being considered.

225.01.03 Analysis. Provide required total design pavement thickness as described in [Section 230.08](#), based on existing layer thicknesses. If more than one design life is being evaluated, show the required total design pavement thicknesses, based on existing layer thicknesses, for each design life being considered.

Where appropriate, provide pH and resistivity information from soil tests that may have been taken. Refer to [Design Manual](#) for selection of pipe materials.

Provide initial quantity estimates for any dust abatement that may be required.

Provide justification for any materials-related, non-pavement rehabilitation work that is being recommended.

225.01.04 Alternates. Describe each alternate being considered. Address each alternate to the pavement descriptions discussed in the Evaluation. List the Equivalent Uniform Annual Cost (EUAC) and/or Total Net Present Worth for each alternate.

Provide justification for any non-usual products or procedures integral to an alternate.

225.01.05 Conclusions and Recommendations. State conclusions in regards to each alternate as developed in the report. Select and recommend the design alternate with the highest priority being the potential of that alternate to address the pavement rehabilitation needs of the project. The secondary priority for selection of the design alternate will be economics.

225.01.06 Appendix. Attach the following:

- Vicinity Map
- Data and analysis sheets from Pavement Structure Analysis
- Life Cycle Cost Analysis
- Manufacturer or vendor information and sample specifications for any non-standard materials or procedures to be used.

SECTION 230.00 – PHASE II SOILS REPORT

The purpose of the soils report is to provide designers with specific information concerning the soils (or rock) encountered over the length of the project and geotechnical recommendations regarding slopes, embankments, and drainage required to construct the project to current design standards. Also included are sources, descriptions of borrow materials required on the project, and pavement structure thicknesses. Investigations for aggregate sources may not be complete, but should be in progress at this stage. An outline of the soils report and description of the information required follows.

On projects primarily consisting of pavement rehabilitation or pavement reconstruction, a Phase I (R) report generally addresses the Phase II Soils issues of concern. Refer to [Section 225.00](#). If a Phase I (R) Report has previously been repaired, a Phase II Report may be needed only to address work to be done that is in addition to pavement rehabilitation or pavement reconstruction. On projects involving widening, minor relocation (curve flattening, etc.), an abbreviated Phase II report may be prepared.

In preparing the abbreviated Phase II report, care must be taken to ensure all relevant sections of the report are included. At a minimum, the report should consist of an Introduction ([230.01](#)), Vicinity Sketch ([230.02](#)), Soils Profile/Pavement Condition Survey ([230.03](#)), Total Design Pavement Thickness ([230.08](#)), Surface and Subsurface Water ([230.16](#)), Drainage ([230.17](#)), Existing Roadway Material ([230.20](#)), References ([230.29](#)), and any other sections that are appropriate. Permission to submit an abbreviated Phase II report does not relieve the author of the responsibility of preparing a complete and thorough report.

230.01 Introduction. Include a brief description of the project. Address the type of project (new alignment, realignment, widening, rehabilitation of existing, etc.) length, width, and grades; types and numbers of structures; existing facilities; and approximate heights of cuts and fills. Describe the alignment and terrain (level, rolling, stream valley, side hill, mountainous, etc.). An elevation range should also be included as well as a brief description of the geology, soils, and vegetation. Reference previous reports and investigations and subsequent investigations proposed.

230.02 Vicinity Sketch. Prepare the project vicinity sketch on a county map base in accordance with [Figure 230.02-1](#). The sketch should show project limits, location of all sources, stockpile sites and waste sites.

230.03 Soils Profile/Pavement Condition Survey. For new alignments or realignments, prepare a soils profile in accordance with [Figures 230.03-1](#) and [230.03-2](#). Cross sections should be included on the soils profile to illustrate typical conditions over the project, special problems, or areas where detailed analyses were made. All boring logs should be shown on the profile and located on the cross sections. One print of the soils profile should be submitted to the Headquarters Materials Section for review. After the review, the soils profiles will be returned to the district. Soils Profiles may be prepared on a roll of paper or on sheets at plan size (11" × 17").

A pavement condition survey should be submitted when an existing route is upgraded, widened, or rehabilitated and construction will not result in significant changes in vertical or horizontal alignment. Include copies of the test pits or borings from the Pavement Condition Survey along with the report. The Pavement Condition Survey is performed as part of the Pavement Structural Analysis ([Section 540.00](#)).

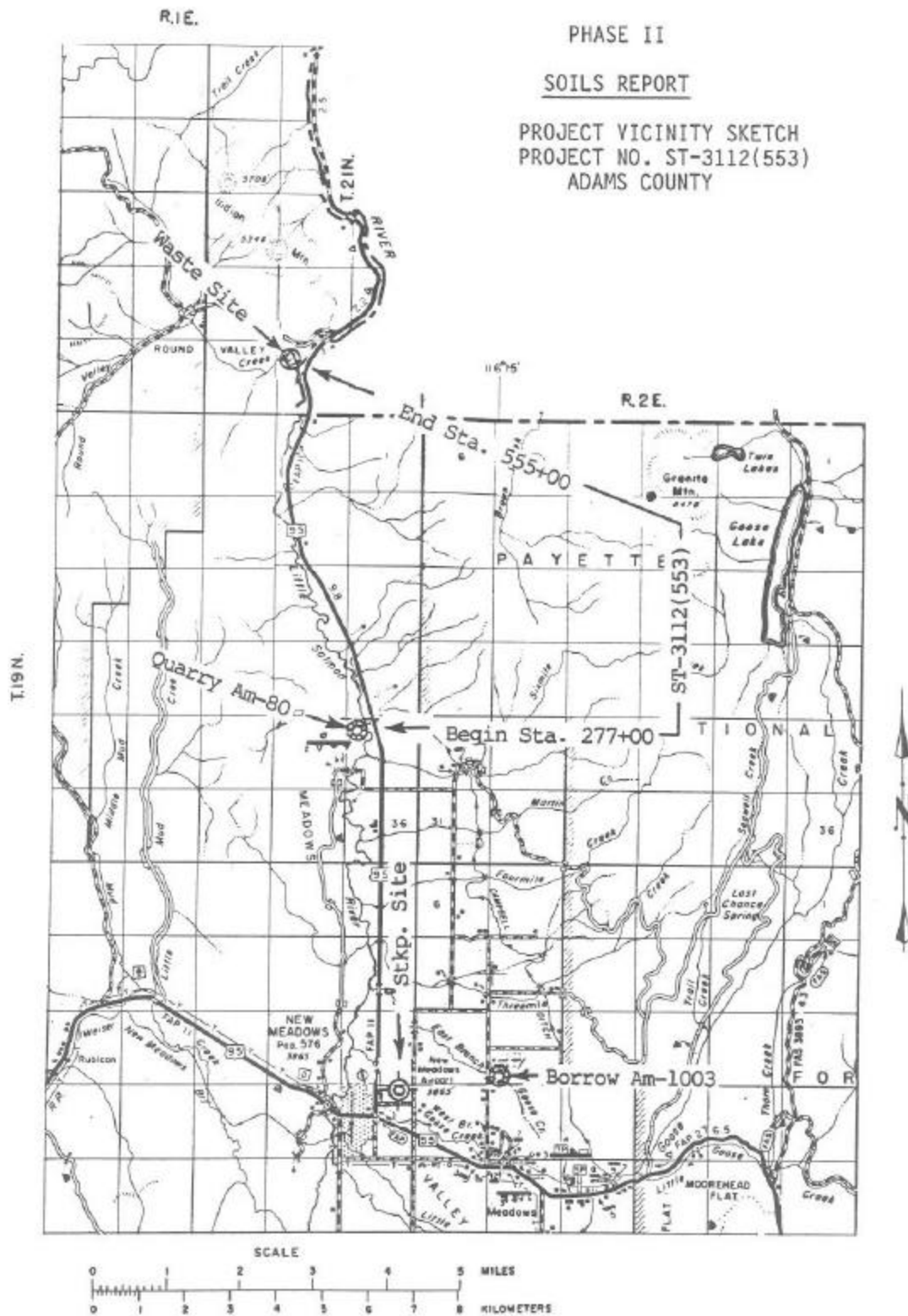


FIGURE 230.02-1

A pavement condition survey shall include a description of the surface condition, recap of the service and rehabilitation record, deflection, testing, and an investigation to determine the thickness of each pavement structure component. Samples shall be taken of the subgrade soils for resistance value (R-value) and expansion pressure tests; base and subbase materials for gradation, sand equivalent, and R-value tests; and surfacing materials to determine the extent of stripping, apparent brittleness, and asphalt content.

An abbreviated Combined Phase I-II Report may be prepared for projects requiring only a pavement condition survey. Where the roadway is to be widened, soils profile width cross sections and a description of special problem areas shall be included.

230.04 Borrow Source Data. Provide the following information for each source when designated sources are specified.

Source Location	Exp. Press. In kPa (psi)	R-Value	Proven Quantity in m ³ (c.y.)	Design Est. Qty Req. in m ³ (c.y.)
-----------------	-----------------------------	---------	---	--

Note any special or selective uses of material from sources, i.e., top soil, select granular material, drain aggregate, use of overburden, etc. Also note special processing which may be needed. If material required exceeds 75% of the proven quantity, then the designer should notify the District Materials Section to confirm the material quantity.

For existing sources, use established county and number code designation for location. The source designation codes and previous test data are available from District or Headquarters Materials Section.

When Contractor Furnished Sources are to be used, indicate in this section that Approved Contractor Furnished Sources are specified.

- Example:

Approved Contractor Furnished Sources are specified.

230.05 Aggregate Inventory Report. Provide the following information for each source when designated sources are specified.

Source Loc.	Ave. Haul Miles	Depth of Over- burden m (ft.)	Max. Size mm (in.)	S.E.	Immer. Comp.	Proven Quantity m ³ (C.Y.)	Recl.* Plan Approv.	Arch.* Clear.
----------------	-----------------------	--	-----------------------	------	-----------------	---	---------------------------	------------------

*Provide dates

Indicate the quantities of material required for the project. Provide a recommended or selected source and reasons for selection.

If expansion pressure controls, so note.

When Contractor Furnished Sources are to be used, indicate in this section that Approved Contractor Furnished Sources are specified.

- Example:

Approved Contractor Furnished Sources are specified.

230.06 Borrow and Aggregate Source Plats. When designated sources are specified, submit copies of drawings; retain originals for final design submittal in the contract proposal to ensure good clear drawings. (Compare source drawings to the example shown in [Figure 270.07.02-1](#) in [Section 270.07.02.](#))

When Contractor Furnished Sources are to be used, indicate in this section that Approved Contractor Furnished Sources are specified.

- Example:

Approved Contractor Furnished Sources are specified.

230.07 Soil Report Summary. On new alignment, realignment, and widening projects, record the main traveled way and station-to-station locations showing where material will originate for subgrade construction (Form ITD-944). Do not place high ballast requirement materials at subgrade. Cap with material having low ballast requirements. For example, see [Figure 230.07-1](#), Form ITD-944.

For pavement rehabilitation projects, a Soil Report Summary is normally not necessary. The following example illustrates a pavement rehabilitation project.

- Example:

This project consists of pavement rehabilitation and no Soil Report Summary was prepared. Boring logs and test pit logs from The Pavement Condition Survey are included in the appendix.

230.08 Total Design Pavement Thickness. Show station-to-station tentative ballast using the following headings:

Sta. to Sta. MP to MP	Actual Thickness in meters (feet)				Design Gr.* Equivalency
	Surface	Base	Sub-base	Total	

*For plant mix pavement.

If the Total Design Pavement Thickness was determined as part of the Phase I report, reference that report. If the thickness was not determined in the Phase I or has changed for some reason, calculate the Total Design Pavement Thickness and include all information used to determine it in the appendix of the Phase II report.

The pavement thicknesses shown here are determined by the design procedures described in [Section 510.00](#), Thickness Design for Flexible Pavement. For other design procedures described in [Section 500.00](#), Pavement Design, use only the applicable parts of the table.

FIGURE 230.07-1

PHASE II
SOILS REPORT SUMMARY



DATE Feb. 02, 1976

PROJECT NO. S. 2775(3) Wendell Spur

CROSSING ROAD FRONTAGE ROAD RAMP MAIN TRAVELWAY STATION TO STATION	MATERIAL FROM CUT STATION TO STATION	LAYER NO.	BOR- ROW NO.	SOILS AT SUBGRADE LAB. NO.	R VALUE	K VALUE	EXPAN- SION PRES- SURE	TRAF. INDEX	TRAF. CLASS	TOTAL FLEXIBLE PAVEMENT THICKNESS			RIGID PAVEMENT THICKNESS	
										ACT. PRES.	GRAVEL EQUIV. R VAL.	DESIGN GRAVEL EQUIV.	CONCRETE SLAB	UN- TREATED BASE
468+44.5 - 473+00		3		261243	22			8.5			2.2	0.9	1.2*	
473+00 - 475+00		1		261242	68			8.5			0.9	0.9	1.2	
475+00 - 483+00	473+00 - 475+00	1		261242	68			8.5			0.9	0.9	1.2	
483+00 - 489+00	473+00 - 475+00	1		261242	68			8.5			0.9	0.9	1.2	
489+00 - 493+00	489+50 - 492+20	2		261245	64			8.5			1.0	0.9	1.2	
493+00 - 504+00	509+50 - 518+84.8	5		261246	65			8.5			1.0	0.9	1.2	
504+00 - 506+00		5		261246	65			8.5			1.0	0.9	1.2	
506+00 - 509+50		3		261247	47		1.14	8.5		1.3	1.5	0.9	1.2**	
509+50 - 518+84.8		5		261246	65			8.5			1.0	0.9	1.2	
Borrow (if needed)			801008	221673	59		0.80			0.9	1.2			
# Undercut to 2.0' in soil - Back fill to subgrade with existing roadway ballast													468+94.5 - 472+50	
** Undercut to 1.5' in soil - Back fill to subgrade with existing roadway ballast													506+00 - 509+50	

This form is used as a tool for design of ballast depths. It represents a section of roadway showing where the soil came from in that section (in-place, borrow or cut section), the lab. number of the soil that the ballast design is based on, pertinent test information of the soil and the design thickness of the section. Design thickness must meet the minimum requirements but consideration must also be given to length, number and practicability of the resulting ballast sections. Placement of materials must be determined through use of the soils profile, computer quantity runs, borrow haul diagram, or special conditions. Unusual conditions may be shown by note at the bottom of the sheet or on attached separate sheet.

Innovations may also be used in given situations, for example, the profile shows a fill section of 1.5 ft. over an in-place soil having a ballast requirement of 2.0 ft. with borrow having a ballast requirement of 1.0 ft. The design of one or two sections of this nature could be shown by note. If there are several sections involved, it might be more practical to use a second sheet and show a second design for the in-place soil independent of the design for the borrow.

GRAVEL EQUIVALENT SUBSTITUTION RATIOS: PLANT MIX 2:1 ROAD MIX C.T.B. AGGREGATE BASE 1:1 GRANULAR BORROW ¾:1

All pavement designs over two years old shall be checked for need of reevaluation.

230.09 Sub-grading. Prepare a station-to-station list of any areas requiring additional excavation (and thicker pavement section) below pavement subgrade due to groundwater or undesirable soil characteristics. Define the limits of sub-subgrading (SSG) on the Soils Profile for reference. Indicate material requirements for backfill and location for disposal of excavated material. Indicate reason for sub-subgrading. If special drainage and/or a subgrade blanket or geotextile is needed, refer to subsequent sections of the report where they are described.

Sub-subgrading should not be confused with over-excavation for embankment foundation.

230.10 Grade Pointing. Grade pointing is sub-subgrading to remove undesirable soils from cut-fill transitions, provide drainage, and/or eliminate abrupt transitions. Installation of perforated pipe drains in grade points, particularly at the downgrade end of cuts, can be beneficial in reducing pavement distress (frost heave, pumping, differential settlement, etc.) in the embankment at or near the grade point. Grade points may be either transverse, longitudinal, or skewed. Again, indicate materials requirements for backfilling and location for disposal of excavation. Note locations of pipe drains. Show limits defining grade points as follows:

Station-to-Station	SSG in meters (feet)	Drainage Direction
--------------------	----------------------	--------------------

230.11 Special Placement. Designate station limits when it is necessary to haul material beyond its logical location on the mass diagram and place it elsewhere, i.e., sub-subgrade excavation, subgrade cap, top soil, or special placement of rock fill.

230.12 Compaction. Specify class of compaction recommended and locations. Special compaction requirements described in subsequent sections of this report should be referenced here. Class C compaction must be defined separately by stations. Refer to [Section 205.00](#), Excavation and Embankment in the [ITD Standard Specifications](#) for compaction classes.

230.13 Slope Design Summary. Designate slopes of all cuts and fills in the summary outlined below. Include special treatment such as pre-splitting, benching, mini-benching, serration or toe keys, sub-drainage, and benching for embankment construction. Indicate dimensions on benches, slopes, and embankments as well as station-to-station locations for slopes requiring special treatment such as retaining walls, rock fall mitigation ditches, interceptor ditches, and interceptor drains. Assign shrink and swell values to the various geologic units that will be encountered in excavation. Use these values to determine average shrink and swell factors for material from each cut or series of cuts. These values should be entered into the summary outlined below.

These slope and special treatment recommendations should be more fully described in subsequent sections of the report. Embankment slopes should be included in the summary and referenced to [Section 230.14](#). Use the following headings for Slope Design Summary.

Sta. to Sta.	Operation	Ht. in meters (feet)	Shrink/Swell (volume change)	Slope	Special Treatments
--------------	-----------	-------------------------	---------------------------------	-------	-----------------------

The Slope Design Summary should be provided for every project where design includes special slope treatments or slopes are more than three meters (ten feet) high.

- An example summary is shown in [Figure 230.13-1](#).

On other projects, such as pavement rehabilitation, the slope design summary information may require only a brief written statement.

- Example:

Slopes shall be constructed at 2:1 or flatter.

- Example:

This project consists of pavement rehabilitation and a slope design summary was not performed.

Station Limits	Operation	Ht. in m (ft.)	Shrink/ Swell	Slope	Special Treatment
0+00-22+60	Cut L Daylight R	18 (60)	+15%	0.5:1	Pre-split; 5 m (15') FBD*; 3 m (10') Bench Elev. 1704 m (5,590') *(Flat-Bottomed Ditch)
22+60-28+10	Cut L Fill R	6 (20) 3 (10)	-5%	1.5:1 2:1	Interceptor Crown Ditch: Serrated Slope Toe Keyway 2 m+/- (7'+/-) Deep and Drain Station 23+20-27+69; Contour Sub- drain Elev. 1685 m +/- (5530' +/-)
28+10-38+40	Series of Low Cuts and Fills	0-3 (0- 10)	-10%	Standard	Serrated Slopes
38+40-42+60	Fill L & R	12 (40)		1.5:1	Rockfill; Toe Keyway 3 m (10') Deep Sta. 39+90-40+20

FIGURE 230.13-1. SLOPE DESIGN SUMMARY

230.14 Slope Design. Indicate basis for slope designs presented above, including special slope treatments and ditches. A station-to-station summary is suggested. Discuss erosion control recommendations such as mini-benches and serrations. Equally important, indicate slopes on which mini-benching or serrations should not be constructed. Reference special reports or addendum's which have or will be prepared for areas requiring special investigation or analysis.

Include assigned or measured strength properties used or needed in analyses. Special recommendations such as grade changes, needed to improve stability, should also be included here. For minor retaining walls such as gabion walls or MSE walls under 10' (3.0 m) in height, the foundation investigation and concept design information may be included here.

Embankment slope recommendations should be discussed. Where all embankment slopes will conform to standards, one sentence to that effect will be adequate. Special slope ratios recommended for stability, erosion, etc., and geosynthetics and features such as counter berms should be discussed in this section. Refer to the Erosion and Sediment Control (BMP) Manual where appropriate.

230.15 Embankment Foundation. Indicate amount and time required for consolidation or settlement of embankment foundations. Discuss stability analyses performed for embankments and/or reference special reports or addendum's. Describe recommended special treatments for stability improvement, to mitigate settlement, or facilitate placement. These treatments may include geotextiles, drain blankets, foundation drainage, toe keyways, benching, over excavation, wick drains, surcharging, waiting periods, counter berms, etc. Designate locations or areas of treatment by station. Refer to other sections of this report if special treatments are described elsewhere, i.e., [Section 230.17](#), Drainage.

230.16 Surface and Subsurface Water. Describe surface water which may require special treatments such as pond or ditch relocation or interceptor ditches. Note groundwater depth and locations where groundwater may cause problems during construction. Show monitored or measured flow data. Evaluate effect of construction on local aquifers and discuss need for well monitoring and replacement water systems. Well data is needed for at least two years prior to construction to establish a base yield level.

230.17 Drainage. Describe drainage features required, and designate locations or areas by station. Reference special reports or addendums which have been or will be submitted and/or special investigations needed. Reference other sections of report such as [230.15](#), Embankment Foundations, if features are described therein. Include dimensions of drain systems, pipe sizes, aggregate design criteria, geotextiles, drain spacing, depth, discharge point, need for erosion protection, etc.

230.18 Retaining Walls. Indicate station-to-station limits and heights of retaining structures required. Reference special investigations and/or Phase IV reports which have been or will be submitted. Phase IV reports may not be needed for walls less than three meters (ten feet) high, and gabion walls three baskets or less in height.

Special investigations will be required for tied back walls, soil nail walls, slurry walls, and other retaining structures requiring structural design. Detailed information for design should be presented in the Phase IV report.

230.19 Blanket Course or Filter Material. Designate, by station interval, any blanket material required for finishing sub-grades, preventing pumping, or covering embankment foundations. The blanket course may be aggregate with or without a geotextile, as appropriate. Filters will typically be geotextiles.

The successful function of blankets and filters depends on their relationship with the material upon which the blanket or filter is placed. Include gradation, permeability, and soil classification data on materials to be blanketed or filtered.

For aggregate blankets, include gradation, thickness, source, and any other pertinent criteria.

For geotextiles, indicate intended function and suitable types; certain functions may require geotextiles to be woven or non-woven, slit film, needle punched, UV stabilized, etc. Approximate ranges of required geotextile properties should be recommended, such as permeability, apparent opening size, and survivability (strength) criteria.

Note that survivability (high, moderate, low) is a function of subgrade conditions and of thickness and particle size in the initial lift of aggregate or granular borrow. Indicate need for sewn seams, if required. Refer to Section. 640.00, Construction Geotextiles and Section 718.00, Geotextiles for specifications.

230.20 Existing Roadway Material. Prepare a station-to-station list of existing roadway material which will be utilized in new construction. Designate the item and its intended placement location. Also indicate if existing material is to be wasted or removed and stockpiled.

For pavement rehabilitation projects, the existing material normally is either wasted or must remain in-place as is the case for a CRABS project.

- Example:

All existing roadway material shall be recycled and shall remain on the roadway. No material may be removed from the project unless approved by the Engineer.

230.21 Abutment Embankment Material. Designate material to be used in embankments supporting structures. Include material requirements and source, and indicate need for selective removal or special treatment such as screening. Reference Phase IV reports for the structure.

230.22 Rock Subgrade. Where granular borrow or other material (including membranes) will be used to finish exposed rock subgrades, provide station-to-station location, source, and material requirements (gradation, SE, thicknesses, etc.).

230.23 Topsoil. Indicate recommended depths and locations for removal of topsoil; note stockpile areas, and make a general statement regarding handling and use of the material. In some cases soil tests may need to be performed to determine the soils suitability for sustaining plant growth. Obtain representative samples from existing topsoil layer and the underlying layer of soil parent material. If sufficient topsoil cannot be generated from the project, contractor furnished sources must be used. (See [Section 270.09](#))

230.24 Pipe. List station-to-station locations showing physical properties of bedding materials in the format shown below. Within the station limits of soils where the pH is outside the range of 6 to 9 or where resistivity is less than 1000 ohm-cm, take individual tests at each site that requires a pipe larger than 610 mm (24"). Confirm results that fall in the special design area of the selection chart ([Design Manual, Table 6-2](#)) by check tests. Test the bed of all live streams.

The condition of existing pipe should be checked for all projects. For projects where pipe replacement is not within the scope of work or intent of the project, indicate in this section the replacement of pipes is not anticipated on the project. However, the condition of all pipes within the project limits should be checked and reported so damaged pipes are not covered with a new roadway. It may be possible to program a project to replace pipes not originally intended to be replaced or allow maintenance crews the opportunity to replace them if the condition is known early enough. Complete information will allow the designers to decide how they want to handle the situation.

Pipe Data				
Station-to-Station	Foundation Unified Soil Class	pH	Resistivity (ohm-cm)	Bed Load*

*A = Abrasive

N = Non abrasive

A recommendation to the designer with the type or types of pipe that will meet the materials criteria may be provided here. Information for a final determination of the type of pipe to be used is included in the Design Manual.

230.25 Riprap. It is advisable to use a contractor furnished source for all riprap required.

Unless previously addressed, state the sizes of in-situ and streambed material as described in [220.03 Soils and Vegetation](#).

Indicate sizes and thickness of riprap required. Recommend placement methods and need for geotextiles and/or cushion layer.

230.26 Staged Construction. If staged construction is desirable such as to allow for consolidation of embankments to accommodate high water, etc., indicate locations, time periods, and/or dates. Staged Construction normally does not refer to project staging or phasing resulting from programming needs or from traffic control needs.

230.27 Dust Abatement. Show total requirements for dust abatement. Recommend type and quantity of dust abatement needed.

- Example:

Approximately 5000 cubic meters of water will be required for dust abatement, assuming 0.15 cubic meters of water per square meter of subgrade.

230.28 Seismic Design. Indicate project proximity to active and potentially active faults and include estimated peak, firm ground, acceleration coefficients (10% probability of exceedence in 50 years, see [Figure 250.05.08-1](#) in [Section 250.05.08](#)). Where peak, firm ground coefficients are greater than 0.10, delineate locations of high potential seismic hazards, i.e., potential rockfall, high groundwater areas where fills are low or have steep slopes, areas where slides in cuts or fills could disrupt emergency traffic or disrupt traffic on critical routes, etc.

230.29 References. List references used to perform analyses and develop recommendations.

Typical references available in the District or Headquarters Materials Section include:

- Materials Manual [Sections 500.00](#) and [600.00](#).
- TRB Publications
- NAVFAC DM-7

- FHWA Research and Development Reports
- NHI Manuals
- Geotextile Engineering
- Rock Slope Engineering
- Rock Blasting
- Geotechnical Instrumentation
- FHWA Soils and Foundations Workshop Manual
- “Soil Mechanics,” Lambe and Whitman
- “Seepage, Drainage, and Flownets,” Cedergren
- “Basic Soils Engineering,” Hough
- Geotechnical Engineering Publications, University of California, Berkeley
- NCHRP Reports
- ITD Materials Section Test Methods
- FHWA Checklists and Guidelines for Review of Geotechnical Reports and Preliminary Plans and Specs.

SECTION 240.00 – PHASE III PAVEMENT ESTIMATING REPORT

The purpose of the estimating report is to provide the designer with the pavement type, typical sections, materials, and estimating data necessary to compute plan quantities and cost estimates for highway paving projects.

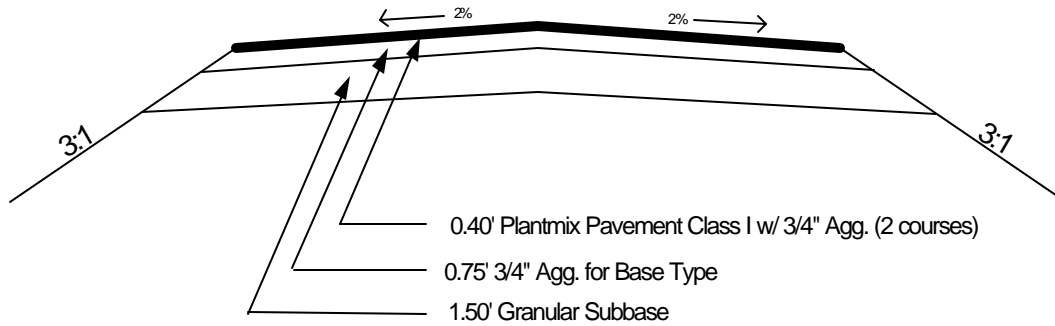
240.01 Pavement Type Determination. Provide a statement as to the pavement type approved. Refer to [Section 540.00](#), Pavement Structure Analysis. Normally the pavement type determination is made when the concept is approved.

- Example:

Flexible pavement was approved October 25, 1987.

240.02 Typical Section. Enclose a sketch showing each typical section for the project. Width, depths, and dimensions need not be to scale. Multiple typical sections with labels depicting the layer material and thickness may be used or a single typical section with layer thicknesses displayed in tabular form as shown in the example. The pavement width or lane configuration shown on the typical sections depicted here are not necessarily as shown on the final plans. However, the thicknesses represented on the final plans must be as shown here.

- Example:



240.03 Base. Show all elements of the base and subbase with appropriate lab report numbers to substantiate the estimating basis. Include asphalt requirements for treated bases, blotter material, tack and prime, fillers, excavation for soft spots, reconditioning, special compaction requirements, or any other item necessary to the designer for estimating purposes. It is desirable to identify possible materials source to be used to determine estimating information for each item.

- Examples:

- Reconditioning

Reconditioning is required from Station 3301+00 to 3392+10. Water for reconditioning will be 750 m³ (200 MG). Excavation of soft spots is required between Stations 3304+00 and 3389+00. Reconditioning is defined in [Section 304.00](#), Reconditioning in the [ITD Standard Specifications](#).

- Treated Base

PG 58-28 Binder for Plant Mix Base Course at 6.5% by weight and 1% hydrated lime filler, for estimating purposes only, Source El-53-s, Lab No. 229749 was used.

MC-250 Liquid Asphalt for Road Mix Base Course at 4.9% by weight, for estimating purposes only, Source El-53-s, Lab No. 85-A0391 was used.

MC-250 Liquid Asphalt for Curing Seal at 1.2 L/m² (0.25 gal./ s.y.). Blotter Material at 5.5 kg/m² (10 lb./s.y.), for estimating purposes only, Source El-53-s was used.

- Tack and Prime

MC-250 Liquid Asphalt for Prime at 1.4 L/m² (0.30 gal./s.y.). SS-1 Diluted Emulsion Asphalt for Tack at 0.2 L/m² (0.05 gal./ s.y.). Blotter Material at 5.5 kg/m² (10 lb./s.y.), for estimating purposes only, Source El-53-s was used.

240.04 Surface Treatment. If Surface Treatment is a necessity, contact HQ Materials for guidance. A review of Asphalt Institute literature is advisable. Specify type of surface treatment and aggregate size with type of asphalt and rate of application. Surface Treatments are very rarely used. Except for special circumstances, the specified information will indicate a Surface Treatment is not to be used. For the purposes of this section, a Surface Treatment is not a Seal Coat. Seal Coats are addressed separately in [Section 240.06](#).

- Example:

- Surface Treatment is not used for this Project.

240.05 Paving. List information and estimating data based on an acceptable Job mix formula, showing percent asphalt, additives, and appropriate lab numbers of corresponding reports. For projects with contractor furnished sources, known lab information from probable or nearby sources may be used. If a probable source is not apparent, estimate the percent asphalt and additives typically used in that area. Replace source and lab number with “estimated”.

- Examples:

PG 70-28 Binder for the Top Course Plant Mix at 6.4% by weight, for estimating purposes only, Source El-53-s, Lab No. 86-A0413 was used.

PG 64-34 Binder for Plant Mix pavement at 5.4% by weight, estimated.

PG 58-28 Binder for the Bottom Course Plant Mix at 6.4% by weight, for estimating purposes only, Source El-53-s, Lab No. 85-A0053 was used.

Concrete Pavement Using Coarse Aggregate Size No. 3 (estimated)

240.06 Seal. List all data regarding the type of cover coat, asphalt additives, and lab numbers. Give consideration to providing a smooth surface for shoulder / bike lanes.

- Examples:

CRS-2R Emulsified Asphalt for Seal at 1.2 L/m² (0.25 gal./s.y.), plus 0.5% Anti-Strip Super Concentrate Additive.

Full width 23 meters (76') for four lanes. Cover Coat Material Class 4 at 14 kg/m² (25 lb./s.y.), for estimating purposes only, Source El-53-s was used.

Fog Coat (Contingency Item) and Blotter.

CSS-1H Diluted Emulsion for Fog Coat at 0.5 L/m² (0.08 gal./ s.y.). Blotter Material at 3 kg/m² (5 lb./s.y.) (estimated).

240.07 Aggregate Estimating Data. List the weight in kilograms per cubic meter (pounds per cubic foot.) for each size aggregate to be used on the project. Include moisture in the weight. For projects with contractor furnished sources, known lab information from probable or nearby sources may be used. If a probable source is not apparent, estimate the weight typical in that area. Replace source and lab number with “estimated”.

- Examples:

Size, Estimated Aggregate Compacted kg/m³ (lb./c.f.).

19 mm (3/4") Aggregate at 2240 kg/m³ (140 lb./c.f.) for Base, including 7% water, Lab No. 217186.

25 mm (1") Aggregate at 2300 kg/m³ (143 lb./c.f.) for Cement-treated Base, including 7% water, Lab No. 218469.

13 mm (1/2") Aggregate at 2300 kg/m³ (143 lb./c.f.) for Plant Mix Base, including asphalt, Lab No. 219649.

19 mm (3/4") Aggregate at 2300 kg/m³ (143 lb./c.f.) for Plant Mix Pavement, including asphalt, Lab No. 219650.

13 mm (1/2") Aggregate at 2300 kg/m³ (143 lb./c.f.) for Road Mix Pavement (dry weight aggregate), (estimated).

Blotter Material at 2000 kg/m³ (125 lb./c.f.), Source El-53-s.

Cover Coat Material at 1400 kg/m³ (87 lb./c.f.), Source El-53-s.

240.08 Aggregate Sources. Include the following information on each aggregate source. When contractor furnished sources are used, the following table does not apply.

- Example:

Source No.	Quantity Proved m ³ (c.y.)	Estimated Quantity Required m ³ (c.y.)	Estimated Quantity of Sanding Material metric ton (ton)	Overburden to be Stripped m ³ (c.y.)	Authority for use Expiration Date	Archeological Clearance Date
El-53-s	115 000 (150,000)	92 000 (120,000)	4500 (5,000)	7700 (10,000)	9/1/75	No Record

- Example
 - Approved Contractor Furnished Sources shall be used for all aggregates.

SECTION 250.00 – PHASE IV FOUNDATION INVESTIGATION REPORT

The purpose of the foundation investigation report is to provide structural designers and construction personnel with specific information regarding the subsurface conditions at a structure site and detailed geotechnical recommendations for use in design and construction. Structures requiring foundation investigations include bridges, buildings, cast-in-place and tied back retaining walls, bin or crib walls, gabion walls, and mechanically stabilized earth (MSE) walls, or supporting structures over three meters (ten feet) high.

Most pipe installations under fills, including foundation considerations, are handled in the Phase II Soils Report. Arches, concrete box culverts, “superspans,” machine passes, half pipes with footings, and other pipe structures which are used in lieu of bridges will typically require a Phase IV report.

Buildings that are larger than 50 square meters (550 sq.ft) will typically require a Phase IV report.

Traffic signal poles, lighting poles are normally constructed with standard foundations as shown in Standard Drawing I-7-C and therefore do not require a Phase IV Foundation Investigation report. However, if a signal pole has mast arm length exceeding 16.7 m (55 feet), then a foundation investigation report may be needed.

Traffic sign structures are normally designed by the contractor and may require a Phase IV Foundation Investigation report.

In general, the Phase IV foundation Investigation report should contain the following sections:

- 250.01 Introduction
- 250.02 Field Exploration and Laboratory Testing
- 250.03 Surface Conditions
- 250.04 Subsurface Conditions
- 250.05 Conclusions and Recommendations
- 250.06 Appendices
- 250.07 Foundation Investigation Plat
- 250.08 References

Consultation with the structural engineer during the preparation of the Phase IV report can help to avoid unnecessary engineering effort.

An addendum to the Phase IV Foundation Investigation report may be needed for some projects. Certain recommendations cannot be made in the Phase IV report until the structure has been designed by the structure engineer. For example, a structure with footing that will be supported by a pile group may need an addendum to address the settlement of the pile group. During the preparation of the Phase IV report, the layout of the pile group is not known and therefore the footing settlement cannot be calculated.

250.01 Introduction. State the purpose and scope of the investigation. Include a description of the proposed structure; location, type, length, number of spans, height above streambed or existing ground, approximate abutment and pier loads, height of approach fills, height of retaining structures, and ground-slope behind retaining structures.

Existing structures and approaches should also be described, including their foundation support. Previous investigations and/or other phase reports for the project should be referenced.

250.02 Field Exploration and Laboratory Testing. This section is a record of what was done and the methods used. Descriptions of materials encountered should be included in subsequent sections. Where exploration and testing are extensive or require detailed description, the text can be placed in an appendix and referenced here.

250.02.01 Borings/Test Pits. Describe the number, location, and depth of exploratory borings or test pits. Describe the type of borings or excavations and exploration method or equipment (auger or rotary drill, casing advancer, backhoe, etc.). Note elevation datum used. Reference Investigation Plat, appended Boring Location, or Site Plan and/or boring and test pit logs. (Copies of boring and/or test pit logs should be appended.)

250.02.02 Field Tests. Describe the field tests and measurements performed during the foundation investigation such as Standard Penetration tests (SPT), solid point penetrometer, Dutch cone (CPT), vane shear, Rock Quality Designation (RQD), groundwater elevation determination, etc. Describe the number and types of soil or rock samples recovered. Make reference to the location in the report where field test results are summarized (usually on boring logs). If no field tests are performed, justification should be given.

250.02.03 Geophysical Exploration. Describe the type and extent of geophysical surveys, including location, number, and length of lines, and explosives, if used. Reference the location in the report where test locations and results are summarized.

250.02.04 Laboratory Tests. List the laboratory tests performed, type of material tested, and purpose of the tests. Summarize the laboratory test results in a table or other appropriate format. Reference appended test results or laboratory report number.

250.03 Surface Conditions. Describe the surface conditions at the site: topography, relief, vegetation, previous and/or existing construction, damage to existing facilities if present, ground surface conditions, surface drainage or lack thereof, etc. Predicted scour depth and stream velocity data (that are normally available from the hydraulic report) should be presented here. Reference sources of information if from previous reports, plans, etc. Reference specific elevations to a datum, i.e., USC&GS, NOAA, or local assigned benchmark elevation.

Be sure local assigned benchmark elevations are referenced to the appropriate USC&GS or NOAA datum. The location of a local assigned benchmark and the nearest appropriate datum benchmark should be described and shown on the Investigation Plat.

250.04 Subsurface Conditions. Describe the subsurface profile, including soil or rock classification, physical properties, strength, compressibility, thickness, continuity, depth-to-rock or rock-like material, groundwater levels, and other conditions such as animal burrows, subsurface structures, frost susceptibility, frost depth, etc., which may have a bearing on the recommendations for foundation design.

250.05 Conclusions and Recommendations. Geotechnical recommendations and design criteria needed for designing the structure foundation should be provided in the following format. Include the basis or justification for recommendations. Use drawings to illustrate recommendations when appropriate.

250.05.01 General. Make general conclusions regarding suitability of foundation types analyzed and recommended.

250.05.02 Foundations. Recommendations and design criteria for foundation support should include the following. Where more than one foundation system is appropriate or feasible, recommendations should be provided for each alternate.

250.05.02.01 Spread Footings.

- A. Allowable Stress Design: If the structure foundation will be designed using Allowable Stress Design (ASD) method, the following information should be provided:

Recommended minimum footing width, depth of embedment, and footing elevation. Setbacks and/or minimum embedments should be presented for footings in embankments or footing near slope.

Allowable footing bearing capacity under static and dynamic load. Include graphs showing bearing capacity versus footing size. Provide coefficient of subgrade reaction k for mat footings.

Coefficient of base friction and, where appropriate, passive resistance against footing edges.

Treatment of supporting stratum, i.e., overexcavation, backfill, compaction, etc.

In case where overall stability of the footing may govern the design, such as a footing on or adjacent to slope, provide global stability analysis of the footing.

Estimated settlement and time for settlement to complete.

For traffic signal poles or sign structures, spread footings are sometimes used instead of typical caissons. The soil strengths resisting lateral movement, overturning and rotation of foundations are very critical. Therefore, additional information on strength of soil around the footing, such as equivalent fluid pressures, coefficient of lateral sub-grade reaction, adhesion of cohesive soils, etc., must be provided.

- B. Load and Resistance Factor Design: If the structure foundation will be designed using Load and Resistance Factor Design (LRFD) method, the following information should be provided:

Recommended minimum footing width, depth of embedment and footing elevation. Setbacks and/or minimum embedment should be presented for footings in embankments or footing near slope.

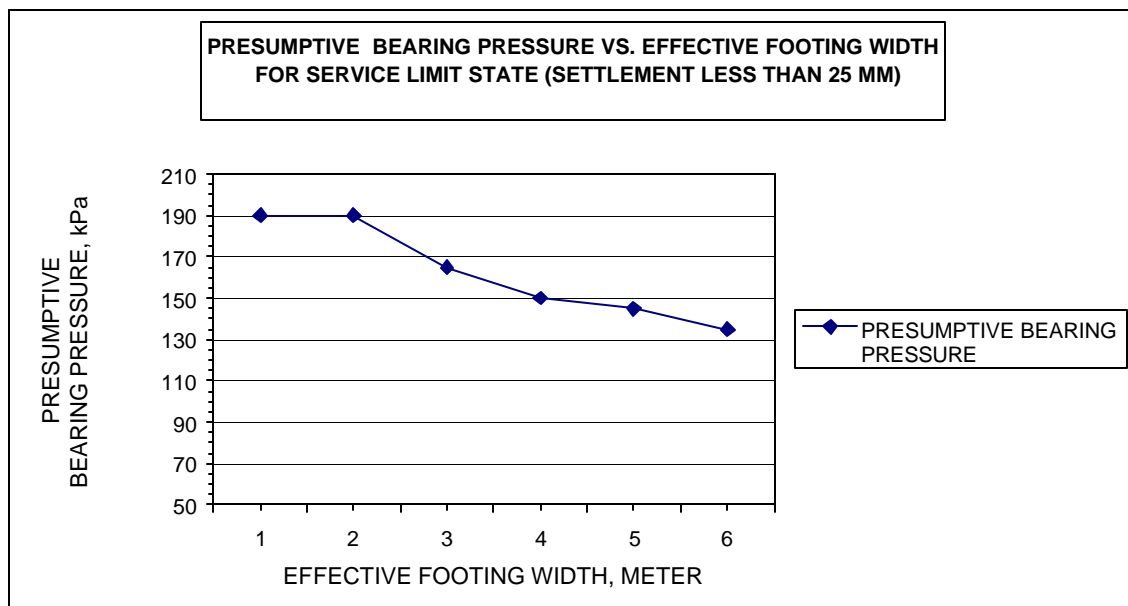
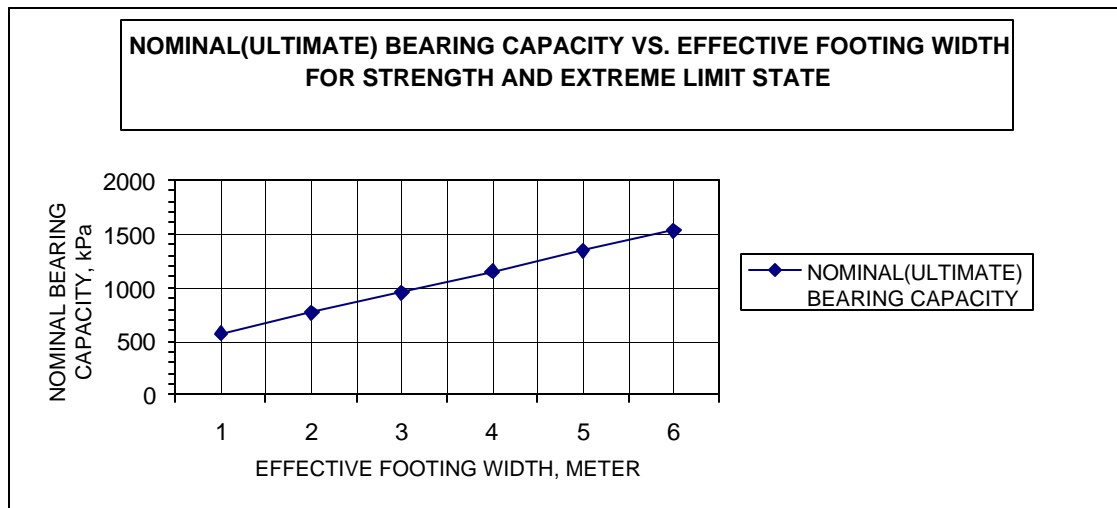
Engineering properties of foundation soil or rock, such as cohesion, friction angle, etc. and method used to determine those properties, such as lab tests, estimating from SPT data, etc. Provide recommended resistance factors for soil or rock at the Strength Limit state based on knowledge of and experience with the involved materials.

Include a graph showing the relationship between the nominal (ultimate, unfactored) bearing capacity and the effective footing width for Extreme and Strength Limit state. Report method(s) used to determine the bearing capacities shown in this graph.

Include a graph showing the relationship between the presumptive bearing pressure and the effective footing width for Service Limit state. Service limit state for spread footings is normally governed by footing settlement. For cohesionless soils, settlement plots are typically based on estimated settlement of 25 mm (1 inch). However, a family of curves for different magnitudes of

settlement would be more useful in some cases. Report method(s) used to determine the presumptive bearing pressures shown in these graphs.

Examples of the nominal bearing capacity and presumptive bearing pressure versus effective footing width are shown below.



250.05.02.02 Deep Foundations.

- A. Allowable Stress Design: If the structure foundation will be designed using the Allowable Stress Design (ASD) method, provide the following information:

Type of deep foundation, such as piling or drilled shaft. Pile type(s), size(s), tip protection if needed. Drilled shaft diameter(s). (Recommend only one type or size of pile or drilled shaft unless it is necessary to recommend several different types or sizes. Discuss with the structural engineer before making the recommendation).

Pile or drilled shaft length, embedment, and tip elevation. Indicate minimum spacing for piles or drilled shafts and supporting stratum.

Allowable vertical load (how estimated), negative friction, and uplift resistance if applicable.

Estimated settlement of pile group (if available) and time for settlement to complete.

Allowable lateral load and point of application in each direction of the principal axes of the pile, estimated point-of-fixity of pile or drilled shaft. Graph showing relationship of pile (or shaft) deflection and allowable lateral load. A series of graph showing pile (or shaft) top deflection from approximate 6 mm (0.25") to 50 mm (2") in increment of 6 mm (.25") of deflection should be provided (for no scour and scour condition, if scour is expected). Graph showing relationship between lateral loads and moments induced in piles should be provided if available.

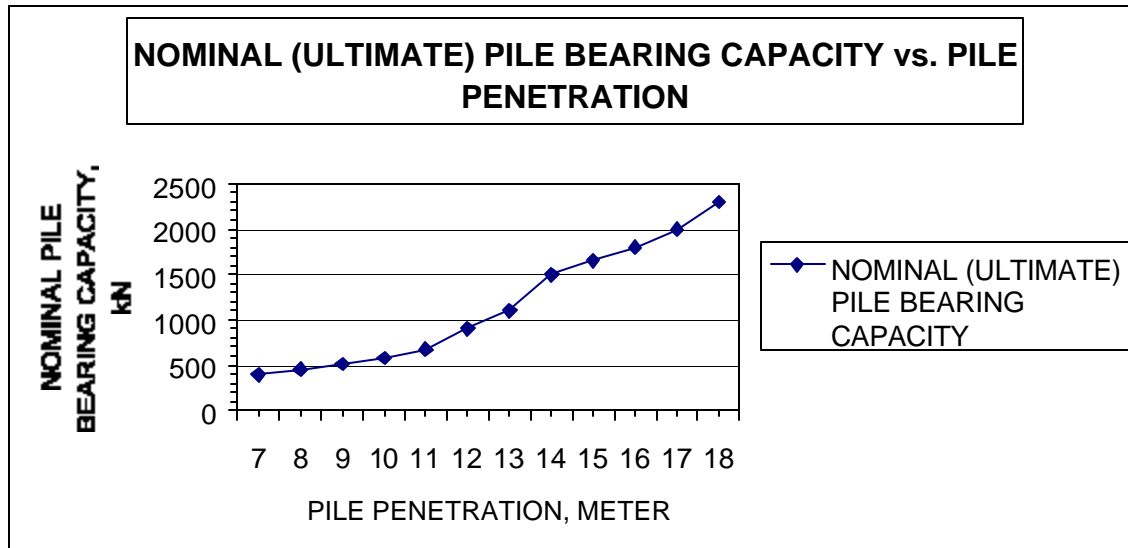
Include recommendations for highest permissible tip elevation or minimum penetration, if applicable. Determine pre-drilling needs, diameter and depth of pre-drilled hole, backfill material, and state purpose of pre-drilling.

Translational stiffness coefficient, for all three dimensions, may have to be provided for seismic design of the pile foundation.

- B. Load and Resistance Factor Design: If the structure foundation will be designed using Load and Resistance Factor Design (LRFD) method, the following information should be provided:

Engineering properties of foundation soil or rock, such as cohesion, friction angle, etc. and method used to determine those properties, such as lab tests, estimating from SPT data, etc. Provide recommended resistance factors for soils or rock at Strength limit state based on knowledge and experience of the involved materials.

Graph showing the relationship between nominal (ultimate, unfactored) pile (or drilled shaft) bearing capacity and pile (or drilled shaft) penetration for Extreme and Strength Limit states. List method(s) used to determine pile (or drilled shaft) bearing capacities shown in this graph. An example of this graph is shown below. If scour is expected, graph of pile capacity versus penetration for scour condition should also be provided.



Graphs showing the relationship between nominal (ultimate, unfactored) lateral loads and pile (or drilled shaft) deflections (and moments if available) and method used to develop these relationships, such as COM 624 or LPILE computer program (for each direction of the principal axes of pile). A series of graph showing pile (or shaft) top deflection from approximate 6 mm (0.25”) to 50 mm (2”) in increment of 6 mm (.25”) of deflection should be provided (in no scour and scour condition, if scour is expected).

Settlement magnitude and rate of a single pile (or drilled shaft) and pile (or drilled shaft) group (if layout of pile or shaft group is known), which is caused by presumptive loads at Service limit state. Estimated down-drag load (negative friction) on pile or drilled shaft, and uplift resistance of pile or drilled shaft if applicable.

Translational stiffness coefficient, for all three dimensions, may have to be provided for seismic design of the pile foundation.

250.05.03 Lateral Pressures and Backfill. Provide recommendations for type and source of abutment or wall backfill, strength parameters, and recommended lateral earth pressures. For abutments, lateral pressures should include active, at-rest, and passive values accounting for the potential effects of hydrostatic pressures; traffic or other surcharge pressures; and pressure distributions as appropriate. In areas of high potential ground accelerations, dynamic pressures should be evaluated.

250.05.04 Anchors. On tied back wall projects or where foundation anchors will be needed, provide design criteria for anchors. Recommendations regarding bond zone length and bond stress should be carefully worded to include specific conditions assumed in analysis. Normally, these data are for ITD estimating purposes only and should be so noted. Free (un-bonded) length and corrosion protection criteria should be included.

This section may be deleted for projects without anchors.

250.05.05 Drainage. Provide recommendations for surface and subsurface drainage where required, and recommended drainage behind retaining walls, abutments and wing walls (pipes, drain blankets, weep holes, etc.). Include type and source of materials and gradations of protected soil if

filters will be used. Provide recommendations for abutment embankment foundation drainage where needed. These may include drain blankets, perforated pipe, vertical drains, etc.

250.05.06 Embankments. Provide recommended side slopes, embankment zonation and facing, compaction levels, foundation treatments, and estimated amount and rate of settlement. Where appropriate, provide recommendations for special items such as instrumentation, placement rates, waiting periods, and surcharge requirements.

Refer to drainage in previous sections when necessary. Refer to stability analyses methods and results or to discussion and results presented in an appendix. Seismic stability should be evaluated in areas of potentially high ground acceleration.

250.05.07 Erosion Control. Provide slope paving, riprap, and scour protection recommendations.

Include potential source for riprap along with the design stone size and layer thickness (available from hydraulic report), placement method, need for graded or cushion layer, and geotextile filter. Gradation, classification, and permeability estimates are needed for the filtered soil.

Recommendations for serrations, seeding, rock armor, etc. for slope protection.

250.05.08 Seismic Design. Provide a design peak, velocity-related, acceleration coefficient (10% probability of exceedence in 50 years) for the project location (see [Figure 250.05.08-1](#)). Include data on depth-to-bedrock or rock-like material. Provide estimate and/or analysis of liquefaction potential. Note other potential seismic hazards such as slope failure, flooding, fault rupture, and proximity to active or potentially active faults.

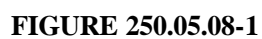
For bridges in seismic design categories B, C, and D (AASHTO Guide Specifications for Seismic Design of Highway Bridges), the Bridge Design Section may elect to make a dynamic analysis. Analysis of liquefaction potential or ground stability may require use of the dynamic ground response programs such as “SHAKE.”

[Figure 250.05.08-2](#) shows effective peak firm ground (rock) accelerations. These values are more appropriate where base accelerations are needed for site-specific analyses of embankments or liquefaction.

Dynamic analyses require that additional soil parameters be included in the Phase IV report. A list of the soil parameters needed for dynamic analyses are shown on [Figure 250.05.08-3](#).

250.05.09 Construction. Describe any unusual construction problems or requirements such as casing needs, sequence of embankment placement, equipment mobility, de-watering, temporary excavation support, seasonal construction, equipment size limitations, etc. For pile foundations include hammer energy limitations, zones of hard driving expected, obstructions such as boulders, redriving requirements, setup time, test piles, results of wave equation analysis, if performed during design, need of pre-drilling for piles, etc.

Recommend Pile Dynamic Analyzer (PDA) test when needed and number of piles to be tested. Recommend non-destructive tests for drilled shaft, such as Crosshole Sonic Logging or Gamma-Gamma testing, if needed.



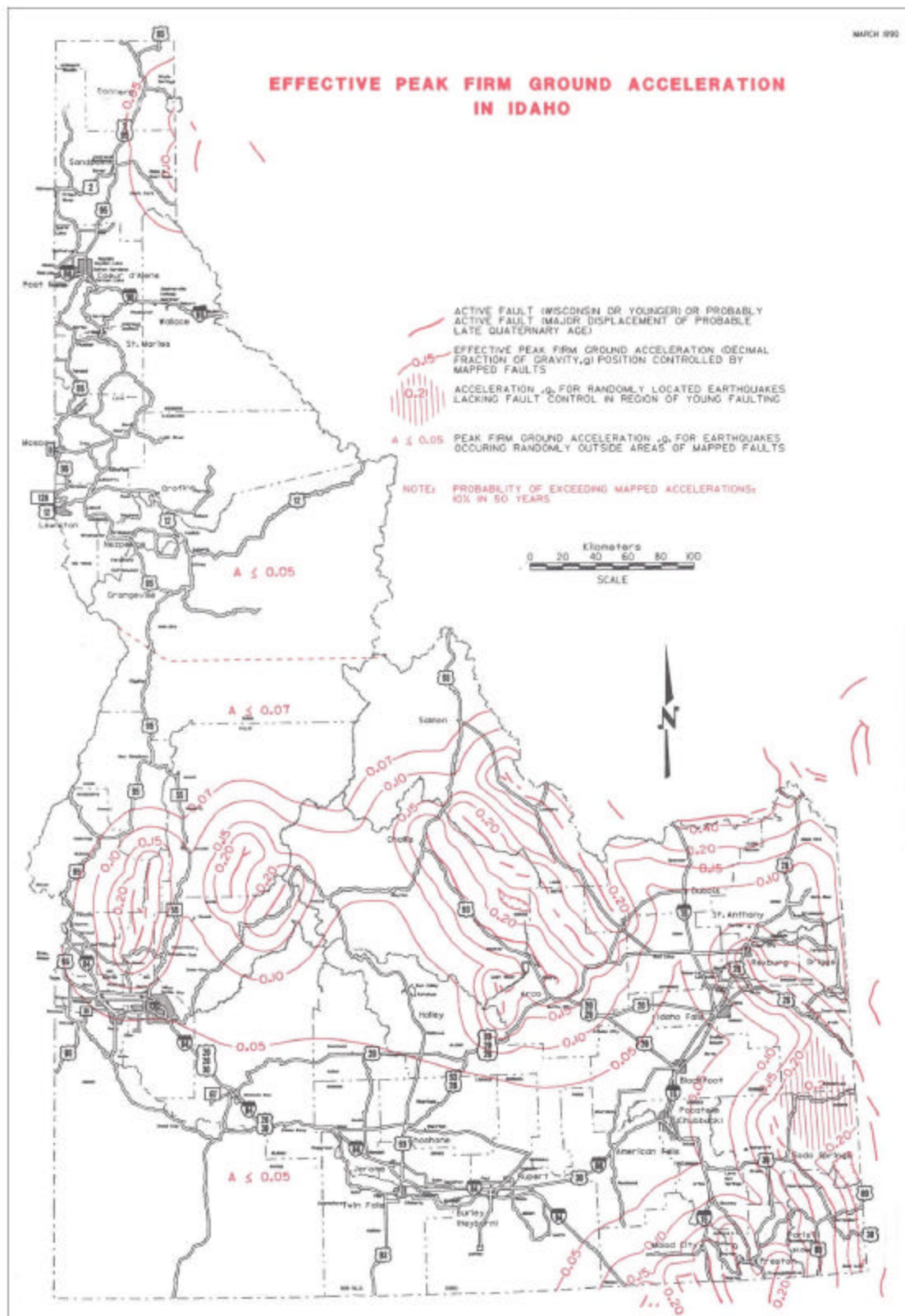


FIGURE 250.05.08-2

SOIL PARAMETERS	
<u>Foundation Type/Problem</u>	<u>Typical Soil Parameters Needed</u>
Abutment Design	Friction Angle, ϕ Unit Weight, γ Young's Modulus, E_s
Footing Stiffness	Shear Modulus, G Poisson's Ratio, ν
Piles and Drilled Shafts	Friction Angle, ϕ Shear Strength, c Unit Weight, γ Strain at 50 % of the peak axial stress of unconfined compression test, ϵ_c
Ground Stability	Liquefaction Strength, τ/σ_v Unit Weight, γ Permeability, k Coefficient of Compressibility, m_v Relative Density, D_r

FIGURE 250.05.08-3

250.06 Appendices. When needed to supplement recommendations, include bearing capacity curves and illustrations for wall backfill, drainage, lateral pressures, embankment zonation, instrumentation details, etc. A reduced print of the Investigation Plat should be included. Consultant reports must include a Site or Boring Location Plan.

Appended material should also include boring logs, geophysical results, and laboratory test results or ITD lab number. A detailed description of the exploration and testing program may precede the field and lab data, if the text is not included in [Section 250.02](#).

A separate appendix should be prepared to include discussion and analysis relating to large embankments, high cuts, unusual or heavily loaded foundations, stability problems, or soft foundation problems. This discussion is intended to document and support the conclusions and recommendations.

Calculations, such as calculations of footing bearing capacity, embankment settlement, slope stability, etc. should be included in the Appendix.

250.07 Foundation Investigation Plat. The Foundation Investigation Plat should be prepared in accordance with the format example in [Figure 250.08-1](#). (Note that for a bridge, the title block of the plat is that for a bridge plan, not a roadway plan). Plats shall be prepared on standard 560 mm × 915 mm (22" × 36") mylar sheets. The original mylar and five prints on white paper at plan size 280 mm × 432 mm (11" × 17") shall be sent to the Materials Section. The Materials Section will send the full size mylar, reproducible to the Bridge Design Section. Prints will be distributed to Roadway Design, Materials, District Project Development, District Materials, and FHWA. For buildings and traffic signal poles or sign structures, a plat on full size mylar sheet is not needed and only five copies of the Foundation Investigation plat on white paper in plan size will be required.



Basic plan controls, lettering, etc., shall be in accordance with [Section 800](#) of the [Design Manual](#). The scales are left to the individual preparing the plat, but should be large enough to properly illustrate the information when reduced 50 percent. Since plats will be published at 1/2 size, scales should be noted as applying to full size drawings. A bar or graphic scale should be included on the plan view. Where elevations and stationing are shown on the profile and elevations are shown on the graphic logs, scales may not be needed on these views.

The following note should always be included in the plat: “The Foundation Investigation Report, boring logs, and other information related to foundation investigation for this project are available at the ITD District Office or Materials Section in Boise.”

The final plat must be sealed and signed by the Professional Engineer or Geologist who is registered in Idaho and was responsible for the work.

250.08 References. The following is a partial list of foundation design references available in the District or Headquarters Materials Sections. References cited in the Phase IV report should be listed in a references section following [250.05](#).

- AASHTO Standard Specifications For Highway Bridges
- NAVFAC DM-7
- FHWA Soils and Foundations Workshop Manual
- FHWA Manual on Design and Construction of Driven Pile Foundations
- FHWA Checklist and Guidelines for Review of Geotechnical Reports and Preliminary Plans and Specifications
- “Foundation Engineering” Peck, Hanson & Thornburn
- “Foundation Engineering Handbook,” Winterkorn and Fang
- “Principal Of Geotechnical Engineering” B. M. Das
- “Earthquake Engineering,” Wiegel
- “Soil Mechanics” Lambe & Whitman
- “Foundation Analysis and Design,” Joseph E. Bowles
- “Foundations On Rock” D.C Wyllie
- “Basic Soil Engineering,” B. K. Hough
- “Foundation Design,” Teng
- “Geotechnical and Foundation Engineering”, Robert W. Day
- “Pile Foundation Analyses and Design,” Poulos and Davis

- “Lateral Stresses in the Ground and Design of Earth Retaining Structures,” ASCE, 1970 Speciality Conference
- FHWA Geotechnical Instrumentation Manual
- NHI Geotextile Engineering Manual
- “Drilled Shafts: Construction Procedures and Design Methods” FHWA Publication #FHWA-IF-99-025

SECTION 260.00 – PHASE V SPECIAL PROVISION REPORT

The purposes of the special provision report are to:

1. list aggregate source and cost of materials for the project;
2. provide special provision specifications for materials and/or construction activities not covered in the standard specifications;
3. provide Notes to Contractor for materials and/or construction activities;
4. provide Notes to Designer to clarify specification and note intent to the designer and provide additional information that will not normally be included in the contract document;
5. provide Notes to Resident Engineer that give additional information on administering the work described in the special provisions or modifications and will not normally be included in the contract.

Additionally, any materials related project design requirements that are not included in the Phase I through IV reports are to be included with this report.

Information included in the Phase V Special Provision Report is intended to be inserted into the contract document by the designer as it was written by the Materials section. Therefore, it is very important that information provided in the Phase V Report be written clearly and concisely using language and formatting consistent with the standard specifications.

The District Materials Engineer or materials consultant should coordinate with the designer to ensure the requirements of the Materials Phase V report are included in the Final Design submittal.

260.01 Source Identification. Materials source issues tend to “set the tone” for a project; thus the source identification section in the contract should be as concise as possible to avoid misinterpretation by the contractor and construction/inspection personnel. It is undesirable to provide information in this section that is repeated elsewhere in the contract.

Listing of specific aggregate and embankment items in this section should be avoided due to potential conflict involving other materials source and design requirements. However, identification in descriptive terms of such materials in this section is appropriate to communicate the intent of the project.

The ITD contract format begins with a reference to the Standard Specifications, SSP’s, standard inserts, etc. Identification of individual specifications in this section tends to decrease emphasis on other specification requirements. For these reasons an initial statement in this section referring the reader to

specifications in general is considered optional. Any additional information is to be covered in the body of the Phase V report and the contract.

Also, it should be recognized that “materials” include more than borrow items and crushed aggregates. Purchased products include specified materials. However, the vendor or “materials source” for such products should be addressed as appropriate in the specifications.

260.01.01 Designated Sources. Identify the source(s) and give a brief general description of those materials for which the designated source is being identified. It is undesirable to list specific pay items in this section and specific pay items may be listed only if there are no other known sources for those items in the area.

260.01.02 Contractor Furnished Sources. Give a brief general description of those materials for which a contractor furnished source is being identified. Avoid listing specific pay items.

260.01.03 Cost. A brief guidance statement regarding cost may be included in each of the above sections or a single brief guidance statement covering cost issues for both sections may follow. If contractor furnished sources are being specified, the contractor is responsible for all costs in obtaining approval to use the source(s) and inclusion of cost information in the report is optional.

260.01.04 Examples.

EXAMPLE #1:

SOURCE IDENTIFICATION

Refer to specifications.

Designated sources. Designated sources are not identified for this project.

Contractor furnished sources. The contractor shall furnish approved source(s) for all materials to be embanked or processed for placement. A list of State-owned or State-controlled sources is available at the District office. Written approval of the contractor’s source operation plan will be required prior to acceptance of material or use of State owned or State controlled sources.

Cost. The use of State-owned sources will incur a royalty fee of \$0.65 per cubic yard or \$0.85 per cubic meter.

EXAMPLE #2 (depleting a source):

SOURCE IDENTIFICATION

Refer to the specifications.

Designated sources. Source Ab-123-s is identified for use for all materials to be embanked or processed for placement on this project. A source investigation plat and proposed source operation plan are included in the plans. Reclamation of the source shall commence subsequent to roadway construction.

Contractor furnished sources. Source Ab-123 is anticipated to contain sufficient quantities of acceptable materials. If the source becomes depleted prior to substantial completion, the contractor will be required to furnish an approved source for remaining materials in accordance with the specifications.

Cost. The use of source Ab-123, incurs a royalty fee of \$0.65 per cubic yard or \$0.85 per cubic meter.

EXAMPLE #3 (numerous contractor furnished and state sources in the area):

SOURCE IDENTIFICATION

Designated sources. Designated sources are not identified for this project.

Contractor furnished sources. The contractor shall furnish approved source(s) for all materials to be embanked or processed for placement.

Cost. The contractor will assume all costs incurred in obtaining approvals for use of source(s).

EXAMPLE #4 (assuming no sources in the area):

SOURCE IDENTIFICATION

Refer to the specifications.

Designated sources. Source Jo-456-s in Jones County is identified for use for Riprap. This source represents a 37 mile haul distance. Use of Jo-456 other than loading and hauling riprap between the hours of 7:00 am and 7:00 pm will require a county use permit.

Contractor furnished sources. The contractor shall furnish approved source(s) for all materials to be embanked or processed for placement.

Cost. Source Jo-456-s is approved for use for Riprap only at no cost to the contractor. The contractor will assume all costs incurred in obtaining approvals for use of source(s).

EXAMPLE #5:

SOURCE IDENTIFICATION

Refer to the specifications.

Designated sources. Existing embankment material is identified in the plans for use in construction of new embankments.

Contractor furnished sources. The contractor shall furnish approved source(s) for all other materials to be embanked or processed for placement. A list of State-owned or State-controlled sources is

available at the District office. Written approval of the contractor's source operation plan will be required prior to acceptance of material or use of State owned or State controlled sources.

Cost. The contractor will assume all costs incurred in obtaining approvals for use of source(s).

EXAMPLE #6 (seal coat project):

SOURCE IDENTIFICATION

Designated sources. Cover coat material is stockpiled at Source Ab-345. This material will require washing, screening, and retesting for gradation to be in compliance with current specifications for Class 4 Cover Coat Material.

Contractor furnished sources. Contractor furnished sources are not identified.

Cost. Sufficient quantities of cover coat material stockpiled at Source Ab-345 are available to the contractor at no charge for use on this project. The royalty fee for this material has been paid under a previous contract. No additional payment will be made for washing, screening, and retesting of this material.

260.02 Special Provisions. This section includes any specification regarding the incorporation of materials or construction activities not covered in the Standard Specifications or Standard Supplemental Specifications.

Special Provisions are developed in two ways: (1) Modification of an existing Standard or Supplemental Specification, and (2) creating a project specific specification including bid item(s).

260.02.01 Modification of Existing Specifications. Refer to Standard Specification page, subsection, and title in the format used for Supplemental Specifications. Use terms such as add, delete, modify, or revise to alter the Specification. Modification will not usually create bid items unless measurement and payment are to be accomplished by a different method. When measurements are used, include dual units just as they are used in the standard specifications.

The examples below illustrate typical applications of Modification of existing standard specifications, supplemental specifications, and standard supplemental specifications (S.S.P.).

ON PAGE 473, SUBSECTION 703.11, AGGREGATE FOR GRANULAR SUBBASE

Add the following:

The material shall have a Los Angeles Wear (AASHTO T-96) of 45 or less.

ON SHEET 72 OF 85 OF THE JULY 1998 SUPPLEMENTAL SPECIFICATIONS IN REFERENCE TO SUBSECTION 635.03, CONSTRUCTION REQUIREMENTS

Delete the second sentence and substitute the following:

Stockpiles shall be constructed in accordance with Subsection 106.11 and shall be flat-topped and rectangular in shape.

Moisture content of the anti-skid material at the time of stockpiling shall not exceed 4 percent.

ON SHEET 1 OF 1 OF SSP-307 OPEN GRADED ROCK BASE (ROCK CAP), SUBSECTION 307.01, DESCRIPTION

Delete the text and substitute the following:

This work shall consist of loading, hauling, placing, and compacting open-graded rock base (rock cap) as shown in the typical sections or as directed.

260.02.02 New Specification. New Special Provision Specifications will be numbered consecutively, i.e., SP-1, SP-2, etc., and each given a title. It is not critical to number the SPs in the Phase V report because the projects normally have other SPs and the designer will renumber them in the contract. Each specification will typically consist of the following sections:

- Description - What work is included.
- Materials - Requirements for materials used.
- Construction Requirements - Equipment, procedures, and results required.
- Method of Measurement - How work is to be measured.
- Basis of Payment - How work is to be paid.

At the District's option, Erosion and Sediment Control or Roadside SP's should be included here.

Some Special Provisions are developed to create project specific bid items and, therefore, sections on materials and/or construction requirements are not needed. On more complex specifications, these sections may be further subdivided for individual materials, procedures, and testing requirements or to create multiple bid items.

Special Provisions will govern over standard specifications, supplemental specifications, and plans. Special attention must be given to the way the SP is worded. It cannot be assumed that all standard specifications will apply to the SP. If the intent of the SP is to refer to a materials or construction requirement from another section, It must be referenced in the SP.

Normally, SPs are not written using dual units as would be the case when modifying and existing specification. They should be written using the units established in the plans.

The examples below illustrate creating new Special Provisions.

SP- COLD-MILLING

Description. This work shall consist of cold-milling the existing plantmix surfacing to the depths and widths shown on the typical section(s) in the plans and in accordance with these special provisions.

Materials. The cold-milling machine shall be equipped with automatic depth controls. The depth control equipment shall produce a specified depth of cut to within 3 mm tolerance. The milling operations shall be referenced from a minimum 3 meter ski. An independent grade control, such as a string line rather than a ski, may be used in areas where this type of control is deemed appropriate.

For this type of operation, the independent grade control shall be established and maintained by the contractor in an acceptable manner.

The cold-milling machine shall be operated so as not to produce fumes or smoke.

Sweeping with pick-up type brooms shall be required. Any tailings from the milling operation shall be loaded and hauled to the stockpile site the same day. Brooming shall follow closely until all loose material has been removed. Brooming will be considered incidental work and will not be paid for separately. Care shall be taken to prevent milled plantmix from being spilled or swept onto any lane(s) used by traffic. Any loose material shall be promptly removed from these areas.

Construction Requirements. The texture produced by the milling shall be a uniform surface that will provide optimum conditions for the placement of the plantmix pavement which is to follow. The cold-milling machine shall be limited to a forward speed of 12 meters per minute to obtain the desired results.

The depth and width of the cut shall be indicated on the typical section(s) or as directed. The final cut shall result in a uniform surface conforming to the typical section(s).

Method of Measurement. Milling plantmix surfacing will be measured by the square meter. The quantity to be paid for will be computed from the planed area irrespective of the number of passes required.

Basis of Payment. Payment for accepted work will be made as follows:

<u>Pay Item</u>	<u>Pay Unit</u>
Cold-Milling	m ²

The contract price paid per square meter for milling plantmix surfacing shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals for doing all work involved in milling the plant mix surfacing, and transporting and placing the material removed, as specified in these special provisions and as directed.

SP-1 BACKFILL FOR PIPE CULVERTS

Description. This item shall consist of furnishing and placing backfill materials consisting of approved sand or gravel, or a mixture of approved sand or stone screening with crushed rock, provided there is a substantial excess of sand or stone screening in the mixture.

Materials. All materials shall pass a 3-inch square opening. Acceptance shall be by visual inspection. Material shall meet the requirements of [Section 703.00](#), Aggregates.

Construction Requirements. Backfill shall be placed as shown in the plans. Care shall be exercised to protect the culvert.

Method of Measurement. The method of measurement will be per cubic meter (cubic yard), in accordance with [Subsection 210.04](#), Method of Measurement for Compacting Backfill.

Basis of Payment. Payment for accepted work will be made as follows.

<u>Pay Item</u>	<u>Pay Unit</u>
Backfill for Pipe Culverts	m ³

Note: These examples are for illustration purposes only and may not necessarily be accurate.

260.03 Notes to Contractor. This section includes any Contractor's Notes that need to be Incorporated into the contract. Contractors Notes convey specific information to the Contractor that is not covered by modifications to the [Standard Specifications](#), Standard Supplemental Specifications or Special Provisions.

The notes to contractor are inserted into the contract by the designer as they were written by the Materials section.

The examples below illustrate typical Contractors Notes.

Excess Materials Site. Excess materials sites shall conform to the requirements of [Subsection 205.03\(A\)](#), General and all excess or unsuitable material removed from the project shall become the property of the Contractor.

Soft Sub-grade Soils. The Contractor should anticipate soft, moisture sensitive sub-grade soils throughout the project. These soils will be prone to rutting or pumping under construction machinery or if they become wetter than optimum moisture content at the time of construction.

It shall be the responsibility of the Contractor to protect these soils during construction activities. The Contractor shall determine how best to achieve this requirement. No separate measurement or payment shall be made for any excavation or replacement of excavated material below sub-grade elevation made necessary from construction activities.

260.03.01 Notes to Designer. This section includes any Designer Notes that the Materials section feel will help the designer to incorporate the materials information into the contract. Designers Notes convey information to the designer about a materials item, explaining its intent or how it should be incorporated into the project. It may also be used to remind the designer to include standard materials inserts. This is information that does not belong in the contract document. The example below illustrates typical Notes to Designer.

Insert the most current version of S.S.P. 307–Open Graded Rock Base (Rock Cap)

260.03.02 Notes to Resident Engineer. This section includes any Resident Engineer Notes that the Materials section feels will help the Resident Engineer administer the contract. These notes convey information to the Resident Engineer about materials items, explaining its intent or how it should be administered. It may also be used to remind the inspector that certain testing equipment may be required for the work. This is information that does not belong in the contract document. *Notes to Designer and notes to Resident Engineer should be used if they can clarify materials information.*

SECTION 270.00 – MATERIALS SOURCES

270.01 Reconnaissance. The District Materials Engineer reviews potential sources by one or more of the following means:

- Airphoto reconnaissance.
- Geological or pedological maps of the area.
- Information available in area offices of the Soil Conservation Service, U.S. Geological Survey, or Department of Water Resources.
- District source records and maps.
- Field reconnaissance will often involve a geological interpretation of geomorphic land forms, stream action, etc., in an attempt to determine where suitable materials are likely to be found. Look for mining claims in the field and search for possible mineral leases at this time to be reasonably certain that the parcel is free.

270.02 General Procurement. Refer to Section F of the Right-of-Way Procedures Handbook for general procedures.

All options should be for a year. Weather, crop interferences, workload, appraisal, and negotiations normally require more time than the usual 6-month option provides.

Determine long-range (20-50 years) need for the source.

Evaluate the risk of losing use of the source through changes in environmental concerns, development, and zoning.

Upon execution of the lease for investigation, perform the investigation in conformance with Idaho T-27.

Have a land survey and plat made of the source if it is to be purchased.

Where a land survey is not required, such as for a borrow source, tie the boundary survey to a permanent feature such as a county road intersection or a public land corner.

270.02.01 Lease/Purchase Option. This option provides three important functions:

- Establishes the right to enter and do exploration for a reasonable fee.
- Avoids the possibility of incurring exploration and other investigation costs only to find that the land cannot be purchased or leased at a reasonable price.
- Provides a legal means of paying rent and exploration-related damages.

The amount paid for the option will be based principally on a rental fee and possible damages.

An agreed price per acre or royalty price must be established and entered in the option agreement.

270.02.02 Procurement Within the Right-of-Way. If a portion of an existing right-of-way is to be used as a materials site, determine how the right-of-way was obtained.

Lands withdrawn from Federal Lands for public highway purposes are to be used only to build and maintain that section of highway.

Use of a portion of this right-of-way for a materials site requires a withdrawal, free, or special use permit in accordance with the regulations of the agency controlling the land.

Rights-of-way across Tribal Lands are handled the same as Federal Land except the permit must be obtained from the appropriate Tribal Council.

Rights-of-way granted by easement deeds then abandoned revert to the underlying owner.

270.02.03 Procurement of Federal Lands. The use of materials from Federal Land is arranged through Free Use or Special Use Permits or other means, depending on the regulations of the government agency controlling the land.

The district selects the materials site in cooperation with local representatives of the agency responsible for administration of the land and in accordance with applicable provisions under [Section 270.02](#), General Procurement.

Prior to initiating procurement of Federal Land, a check for mining claims should be made.

The district initiates procurement by sending a request and exhibit showing location, land tie, and boundary survey of the area to the Right-of-Way Section.

Ample time must be allowed for processing the procurement request as it goes from the Right-of-Way Section to the FHWA Division Office, the local representative of the agency, the FHWA Division Office, the FHWA Region, and back to the Division Office.

270.02.04 Procurement of State Lands. Acquisition of materials from state-owned land is accomplished through a State Mineral Lease.

The district selects the materials site in cooperation with the local representative of the Department of Lands and in accordance with applicable provisions under [Section 270.02](#), General Procurement.

The district initiates procurement by sending a request and exhibit showing location, land tie, and boundary survey of the area to the Right-of-Way Section.

State Mineral Leases are granted for a maximum of 5 to 10 years.

State Mineral Leases call for an annual rental fee plus a royalty for material used.

Department of Lands bills ITD for the annual rental and requires a report of usage monthly from the districts.

The district completes the reports.

All billings and reports are handled by the Right-of-Way Section, including payment.

The State Land Board has reserved the mineral rights, including sand and gravel, on all land it has sold since 1923.

If the deed to the land reserves the mineral rights to the state, a State Mineral Lease must be obtained in addition to the lease or purchase required from the owner of the surface rights.

The state, through the Department of Lands, claims all land between the high-water lines of any navigable river or stream in the state.

A State Riverbed Lease is required for removal of material from between high-water lines of navigable rivers or streams.

Streambeds may also be claimed by adjacent property owners or Indian Tribes if the stream crosses the Reservation.

State Riverbed Leases require additional time, as public hearings are required prior to issuing the lease.

The Department of Lands has accepted a conversion factor of 1 cubic meter (1 cubic yard) being equal to 1.80 metric tons (1 1/2 tons) and will accept engineers' estimates based on either ton or cubic yard.

270.02.05 Source Control. The district is responsible for maintaining an inventory of quantities used from sources, estimated amount remaining in the source, and whether the Department desires to continue use of the source.

The district is responsible for initiating payment for materials obtained by royalty. The special provisions of a contract may require the contractor to make these payments directly to the lessee, including the State Land Board. The district is responsible for making payments for any materials taken by Idaho Transportation Department forces.

After a project is advertised, the area to be worked will be flagged and cross sectioned from a base line referenced to the boundary monuments. It is essential that the contractors operate in the designated area in order to fully utilize the source and comply with the intent of the final reclamation plan.

Form ITD-964, Summary of Crushing Operations, shall be submitted to the Materials Section for all aggregate sources upon completion of each project.

270.02.06 Conservation of State-Owned Materials Deposits. When possible, new material deposits should be located for new construction. Do not use deposits currently owned by the Department for new construction unless absolutely necessary. These deposits should be saved for future betterment and maintenance work.

Develop all deposits in such a manner as to make usable all acceptable materials within the deposit.

Do not sell, give away, or otherwise remove any material without authorization. Sources of materials are becoming increasingly scarce and the resource must be managed prudently. This policy does not preclude a working arrangement with a county, highway district, or city whereby an exchange of material or funds will permit us to make materials available to them.

Several local agencies have permitted the state to use their sources in the past. This cooperation is desirable, but it is to be mutually equitable. Counties are responsible for procuring material sources for county projects.

270.03 Approval to Purchase. The following information, compiled by the district, is sent by letter to the Materials Engineer to obtain approval for purchase as required by [Administrative Policy A-16-03](#).

- Materials Source Plat and Investigation Record and Reclamation Plan.
- Pertinent information as to the proven quantity and quality of material in the source and quantity of overburden to be removed.
- A list of projects for which the materials are expected to be used and the quantities required based on the six-year program.
- A list of sources in the immediate area available to the Department and the quantities contained therein.
- A sketch map showing location of all projects and sources mentioned in Items 3 and 4 above.
- Market value estimate (from right-of-way).
- Cost benefit analysis, if required.
 - Irrigated or cultivated farm lands may be acquired for materials sources only when marginal, uncultivated land is not economically available for this purpose.
 - Before irrigated or cultivated lands are recommended for materials sources, comparative cost benefit analyses must be made in consideration of the following factors:
 - Cost of Haul
 - Land Tax Classification
 - Quality of Materials
 - Appraisal Price
 - Cost of Reclamation
 - Other Economical Variables
 - The Materials Engineer will advise the State Highway Administrator that a comparative cost benefit analysis has been made of the property by the Department before such land acquisitions have been entered into.

270.04 Source Purchase. The Materials Engineer notifies the Right-of-Way Supervisor by letter upon approval of the quality and quantity of materials in the source to complete action on the Purchase Option.

The appropriate district, upon receipt of a copy of the Materials Engineer's approval letter, will request authority for expenditure of funds. Title reports will be ordered and the usual acquisition procedures will be followed. Also, all fence lines, proposed source lines, and corners must be flagged and the owner must be made aware of the proposed property limits of the precise purchase area. Document an account of the source field trip by letter with a copy to the property owner.

When purchase is approved and it appears that a deed cannot be conveniently executed before the Purchase Option expiration date, the owner must be notified by certified mail of the Department's intention to exercise its option. The District Right-of-Way Agent requests the Right-of-Way Supervisor to prepare and mail such notice. Request should be made at least ten days before the termination date of the option.

270.05 Leases (Private Ownership). Upon approval of the quality and quantity of the materials in the source, the District Materials Engineer will request the District Right-of-Way Agent to complete action on the Lease Option. The written request will be accompanied by the Materials Source Plat and Investigation Record.

If the investigation establishes the source to be unsuitable, then the owner will be advised in writing by the District Right-of-Way Agent and the executed copies of the Lease Option will be returned to him.

The District Right-of-Way Agent will transmit to the Right-of-Way Supervisor three signed copies and four unsigned copies of the Materials Lease ([Form ITD-218](#)) accompanied by source sketches and title reports and will be responsible for:

- Proper completion of the lease.
- Execution by the responsible persons and acknowledgments of signatures.
- Clearance of applicable encumbrances.
- Checking for adequate access and reasonable special provisions.

The Right-of-Way Section checks the title for legal sufficiency and will distribute copies as follows:

- Lessor - 1 signed copy
- District Engineer - 1 signed copy and 1 unsigned copy
- Materials Engineer - 1 unsigned copy
- Department Controller - 1 unsigned copy

The original signed copy will be recorded, indexed, and retained in the Right-of-Way Section files. The Right-of-Way Supervisor will furnish District Materials a copy of the recorded lease.

270.06 Investigation Procedures. Upon execution of the option, undertake the investigation of the source in conformance with Idaho Test Method T-27, "Standard Method of Investigation of Aggregate and Borrow Deposits." Give full consideration to the provisions required for a reclamation plan during the investigation. Archeological clearance of the proposed source occurs after the option is signed and prior to the investigation.

Take samples of all materials encountered in the source. One sample of each material encountered is taken from each test hole. The majority of these samples will be tested in the District Laboratory to establish the test hole log. A representative sample, or combination of samples, is to be sent to the Materials Section for complete testing.

270.07 Materials Source Plat and Investigation Record.

270.07.01 Master Plat and Investigation Record. An example of a Materials Source Plat and Investigation Record is illustrated in [Figure 270.07.02-1](#) in [Section 270.07.02](#).

The plat and record is intended to furnish all the information required to establish the quality and quantity of material in the source, amount of overburden, required reclamation, and property ties and boundaries required for securing use of the source.

The completed Materials Source Plat and Investigation Record shall include all the following information.

The plat shall include a legal description, source dimensions, source boundaries, boundaries of area to be worked, and area bearings and distances to appropriate land ties. An access at least 9 meters (30') wide must be obtained by purchasing permanent easement or as a part of the lease to provide access at time of disposal of the source.

Location and names of streams, creeks, or bodies of water within or immediately adjacent to the source area are to be shown. Existing drainage adjacent to the source is important, as is a final drainage plan after source depletion and reclamation.

Include boundaries of lands that will become affected by the operation of the source showing the acreage, habitations, and businesses, including public streets and highways.

Carefully locate and describe utilities, canals, and irrigation facilities giving ownership, clearances to overhead lines, and easement areas, as well as depths to buried cables, gas, sewer, or water lines.

Show the locations of all test pits and borings. Identify by type and number. Include the log of each test pit, boring, and laboratory analyses. Include a note indicating that field logs, soil samples, rock cores, and other information related to the investigation may be available at the District Materials Section for contractor review.

Field logs can be included in the special provisions if necessary to better represent the conditions of subsurface materials.

If ground water was not encountered during the investigation, state so in the plat.

Illustrate by cross section or contours, approximate elevations of the ground, indicating how the source is to be worked and reclaimed, and method, if by stage reclamation.

Show locations of stockpiles, waste sites, overburden piles, tailings, ponds, depth restrictions, water table, and silt or clay lenses.

Show the complete reclamation plan and notes on the source plat.

Include a title block in the lower right-hand corner, 50 mm × 75 mm (2" × 3"), on a reduced plan sheet showing the Source Number and Legal Description.

- If purchased, include the following:

Date Purchased _____ from _____

Date Recorded _____ as Instrument No. _____

_____ in Book _____ of Deeds on Page _____, _____

County Records

- If leased, include the following:

Lessor _____

dated _____ Lease Permit No. _____

Expiration date _____

- If obtained by Withdrawal of Use Permit, include the following:

U.S. Government Withdrawal No. _____

B.L.M. Free Use Permit No. _____

U.S. Forest Service Permit No. _____

Prepare a 560 mm × 860 mm (22" × 34") plan sheet in accordance with Surveys and Plans Manual, Part 17, on suitable linen or mylar.

A checklist covering the source map, log of borings, laboratory data, and reclamation plan is included in [Figure 270.07.01-1](#). This checklist should be used by the districts during preparation of the Materials Source Plat and by the Project Development Engineer at Headquarters Materials Section during review of the plat.

270.07.02 Project Plat and Investigation Record. Make a mylar of the master plat and investigation record.

Outline the "area to be worked" stockpile areas and areas previously worked.

Check to make sure adequate test holes have been dug in the "area to be worked" to delineate material to be found there.

Under general notes, describe condition the "area to be worked" is to be left in (i.e., floor slope and side slopes).

Under the final reclamation plan notes, add the specific requirements that pertain to the project.

Examples of Source Plat and Reclamation Plan are shown in [Figures 270.07.02-1](#) and [270.07.02-2](#).

Source No. _____ Project No. _____					
Materials Source Plat and Investigation Record Checklist					
Source of Vicinity	Yes	No	Log of Borings (Contd)	Yes	No
Can projects or portions be shown?			Are depths of each material and depth of hole shown to appropriate scale?		
Are access roads indicated?			Is log of hole representative of field log? Appropriate legend?		
Are standard map symbols used?			Is water present and shown on log with date of recording?		
Is legal description, sections, township, and range given (locate to 1/16 section)?			Are similar holes combined on log?		
Is north arrow shown?			Laboratory Test Results		
Detail Source Plat			Are samples identified to test hole and depths?		
Are bearings and distances of source boundary shown?			Are gradations bracketed for each sieve size?		
Are access roads shown and jurisdiction of road?			Are number of sampling and testing adequate?		
Distance to project and haul road direction?			Are all pertinent data shown (i.e., gradation, sand equivalent, wear, maximum size, etc.)?		
Are bridges and culverts shown?			General Notes		
Scale of plat?			Standard disclaimer paragraph included?		
Are all utilities shown and located accurately with distances, depths, and clearances given?			Operation at source included on plan?		
North arrow?			Final reclamation plan on plan sheet?		
Is area to be worked outlined?			Title Block		
Restricted areas (utilities and future reserved materials, etc.)?			Is source number shown?		
Are cross sections used to clarify work plan?			Is purchase record complete?		
Test hole locations and numbered identifications?			Is lease record complete?		
Log of Borings			Are withdrawal numbers shown, etc.?		
Are borings spaced at 30-60 m?			Checked by: _____ Date: _____		
Are borings extended to depth required for needed quantity?					

FIGURE 270.07.01-1. MATERIALS SOURCES



Submit a white print to Headquarters Materials for review prior to transmitting to Design for incorporation into the final plans.

270.08 Requirements of a Reclamation Plan. Provide a reclamation for each source of borrow or aggregate, whether from public or private lands.

Source Reclamation Plans are prepared in conformance with [Section 47, Chapter 15, Idaho Code](#). No planting is required on certain lands as stated in [Section 47-1510, Idaho Code](#).

For sources to be leased from a private individual, develop an appropriate initial reclamation plan and present it to the property owner for his consideration. Should the owner not wish to use the state's plan, his wishes as to special seeding, fertilizing, mulching, grading, or other planned use should be given full consideration in developing the final plan to be presented to the State Board of Land Commissioners. However, the property owner needs to be made aware of the possibility that his wishes may not be approved by the Land Board.

The Idaho Surface Mining Act of May 31, 1972, applies to all lands within the state and an approved reclamation plan is required from the State Land Board on all sources. The master mylar or copy of the project original mylar source plat illustrated in [Figure 270.07.02-1](#) will be one of the prime documents of our request for approval of reclamation plans.

Maintain the original materials source plat and investigation record in the district files. Upon approval by the State Land Board, the Materials Engineer will notify the district by letter. The district will then add the approval date to the materials source plat.

All sources, whether for earth, borrow, sand, gravel, or rock, must have a map of the source area, with information submitted as required by [Section 270.07](#), Materials Source Plat and Investigation Record. Send three white prints of source plat and sufficient color photographs to illustrate existing field conditions for reclamation approval to the Maintenance Supervisor, Attn: Roadside Manager. The plans will be reviewed for seeding and fertilizer details, then forwarded to the Materials Engineer for final checking and transmittal to the State Land Board.

The Materials Section is responsible for obtaining approval of the source reclamation plan from the State Land Board prior to use. The plan provides for restoration of stable slopes, reseeding of the area to control water and wind erosion, and to provide an area that will not become a nuisance, a hazard to life, or a dumping area. Specifically, the reclamation plan provides that:

- The steepest slopes permitted on earth and gravel cut faces are a 1.5:1. However, flatter seeding slopes are desirable and should be provided whenever reasonably economical.
- Rock quarries should be worked to provide slopes that are no steeper than 1:1 unless adjacent to and a part of naturally occurring rock faces that are steeper. Slopes should blend in with the natural slopes as much as possible.
- Control drainage from the excavation to prevent erosion. Should the excavation be below water, make the banks gently sloping, no steeper than 4:1 to a depth of 1.5 meters (5 feet) and shall provide for egress from the water along the full length of bank. Excavation adjacent to streams shall provide for inflow and outflow of the stream to aid in keeping the water from becoming stagnant.
- Roads are to be obliterated and cross cut to control drainage in steep terrain.

- A drainage plan for the source will be included to prevent siltation of any streams or bodies of water.
- Any locations and limits on depths and areas of any tailings ponds should be shown.
- All test pits or drill holes are to be backfilled or plugged and made reasonably safe to human life, livestock, and wildlife.
- Worn-out equipment parts, tires, tracks, etc., will not be disposed of within the source limits.
- Spread all the overburden or topsoil to a uniform depth and reseed and mulch as specified. Reseeding is not required on barren sand-gravel or rock slopes.

The cost of all grading, drainage, topsoiling, and associated reclaiming and shaping work, including seeding operations, will be paid for in accordance with [Section 211 of the Standard Specifications](#). Conform seeding operations to [Section 621](#), Seeding, of the [Contract Administration Manual](#). The state will furnish the seed at no cost.

Determine seeding requirements and make seed mix selections in accordance with the [Design Manual, Section 14-529](#), and [Contract Administration Manual, Section 621](#). Seed mix selections may be made in accordance with the property owner's wishes when appropriate.

Submit an adequate number of photographs (two or more) of the materials source to document the pre-existing land form and vegetation. Use arrows on the source plat ([Figure 270.07.02-1](#)) to show the locations and directions from which the photos were taken.

The district obtains the necessary approval or comments from the Idaho Fish and Game Department, Water Resource Board, Health and Welfare local regional office, Bureau of Reclamation, USFS, and any other governmental regulatory agency that may be involved.

270.09 Seeding and Fertilizing Proposal.

270.09.01 Seeding Requirements. During Project Development, the following information is to be provided to the District Design Engineer so that proper seeding requirements for each source reclamation plan can be furnished.

270.09.01.01 Location of borrow or material sites and the legal description.

270.09.01.02 If the material source is to be used with a highway project(s), include project number.

270.09.01.03 Soils information required for seed and fertilizer selection:

- Topsoil thickness
- Topsoil pH
- pH of material at the bottom of the source (gravel pits and quarries excluded)

270.09.01.04 Moisture characteristics:

- Is bottom rapid draining
- Is bottom poor draining
- Approximate water table elevation if near the surface

270.09.01.05 Vegetation types on and in the area:

- Grasses
- Shrubs
- Trees

270.09.01.06 Approximate area to be seeded:

- Acres to be drilled
- Acres to be broadcast

270.09.02 Laboratory Testing. If needed, soil characteristics such as pH may be obtained by submitting samples to the the Headquarters Materials Lab for analysis. Laboratory testing is not always necessary if all other characteristics, especially vegetation types, are accurately provided.

Make source seeding plans identical to the related roadway seeding plans in practically all cases. Show them on each source reclamation plan sheet. Failure to show the entire source reclamation plan on the plan sheet (e.g., seeding, fertilization, topsoiling, screening, slopes intended, drainage, etc.) may cause rejection by the State Department of Lands and thus delay the project development.

In addition to an approved reclamation plan, any source altering a channel of a continuously flowing stream requires a permit from the Department of Water Resources.

The excavation in a materials source and the possible influence on the perched water table must be ascertained during the investigation. A survey of the potable water zones must be made to guard against contamination of usable supplies.

270.10 Relinquishing Sources. Sources no longer desired due to depletion or other reasons are to be relinquished. The district informs the Materials Engineer that the source may be relinquished and will furnish the Right-of-Way Supervisor and Maintenance Supervisor copies of the letter. Final approval is required from the Materials Engineer and Maintenance Supervisor on source and stockpile sites, respectively.

Materials Engineer requests approval from State Department of Lands to expire the reclamation plat for a source on State Land. Upon Land Board action, the Materials Engineer will advise the district, Right-of-Way Supervisor, and Maintenance Supervisor of action needed to relinquish the source.

Reclamation of the source must be completed prior to requesting release.

Borrow sources should be released immediately upon completion of construction unless further use for the source is known to exist.

270.11 Source Numbers and Records. Each aggregate, borrow, or quarry source investigated is assigned a source number in numerical sequence, by county, by the District Materials Engineer. These numbers are formed by the county name abbreviation followed by a number assigned in numerical sequence as the sources are located.

For example: The ninety-sixth pit located in Latah County would be designated Lt-96. A complete county prefix list is shown in the following table:

Ad – Ada	Cs – Cassia	Lw – Lewis
Am – Adams	Cl – Clark	Ln – Lincoln
Bk – Bannock	Cw – Clearwater	Ma – Madison
BL – Bear Lake	Cu – Custer	Md – Minnidoka
Bw – Benewah	El – Elmore	NP – Nez Perce
Bg – Bingham	Fk – Franklin	On – Oneida
Be – Blaine	Fr – Fremont	Ow – Owyhee
Bo – Boise	Gm – Gem	Py – Payette
Br – Bonner	Gd – Gooding	Pw – Power
Bn – Bonneville	Id – Idaho	Sh – Shoshone
By – Boundary	Jf – Jefferson	Tn – Teton
Bu – Butte	Jr – Jerome	TF – Twin Falls
Cm – Camas	Kt – Kootenai	Vy – Valley
Cn – Canyon	Lt – Latah	Wn – Washington
Cr – Caribou	Le – Lemhi	

When a source is purchased and the Idaho Transportation Department holds a warranty deed to the property, it is designated by the letter “s” following the number of the source, e.g., TF-49-s. The same number will suffice for all purchased extensions and a new price per cubic yard will be established by the Financial Control Section. The test hole numbering for the extension is carried in sequence from the previous investigation of the original source.

For out-of-state sources, names should be designated by county name, county, state name, source number, commercial source.

- Example:

Designation for commercial source number 12 from Spokane County in the state of Washington: SCW-12c.

When two parcels of land are purchased and the parcels are not contiguous, different numbers will be issued and individual test hole numbering will be required for each source.

270.12 Source Numbers and Reports. When a source for aggregate or borrow proves unacceptable during investigation, the source number is retained and a description is prepared for the source records. This information, together with any tests which may have been made, will assure that the work on this source will not be redone in the future.

The district maintains complete records of each source and furnishes the Materials Engineer with copies of their records for reference and filing.

270.13 Aggregate Material Sources. As provided in [Standard Specifications, Section 106.09](#), material sources are divided into two groups: Designated Sources and Contractor-Furnished Sources. Designated sources are those listed in the contract documents by number and location. Contractor-furnished sources shall include all sources other than designated sources. This includes sources owned or controlled by the Idaho Transportation Department (ITD). The source may be privately owned or owned by a public agency. Any aggregate or borrow material to be incorporated into the project, other than a source designated in the contract, is considered to be a contractor-furnished source and requires written approval from the state for use of the material. Any costs of exploring, developing, and testing for source approval shall be borne by the contractor. Verification testing may be required to confirm the submitted test results.

Specification requirements for all types of contractor-furnished sources include, but are not limited to, the following:

1. Material Sources, [Section 106.09](#).
2. Acquisition of all necessary rights to remove the material including, but now limited to, access and conditional use permits, mineral leases, or owner's written permission.
3. Permits, [Section 107.02](#).
4. Reclamation plan approved by the Department of Lands.
5. Cultural Resource Clearance, [Section 107.18](#).
6. Environmental Protection, [Section 107.17](#).
7. Sampling and Testing in accordance with contract specifications.

Reference [Sections 703.12](#) and [703.13](#) and applicable contract item specifications.

There are various types of contractor-furnished sources:

- **Qualified Aggregate Material Suppliers**

It shall be the responsibility of the District Materials Engineer to keep a current list of qualified aggregate material sources. The source file shall contain all documentation of investigations, clearances, test previously performed, and any other specification requirements. Qualification will be valid for not more than two years. Reference the Field Test Manual, Part II, Section 8.16.

The Resident/Regional Engineer may approve the use of qualified aggregate material suppliers with the concurrence of the District Materials Engineer.

- **Sources Previously Utilized but not on the Qualified Aggregate Material Suppliers List**

When the contractor requests to use a source previously utilized or a new product from an existing source, the contractor will furnish to the Resident/Regional Engineer sufficient documentation, including test data, to substantiate the request. The Resident/Regional Engineer

reviews and forwards the request to the District Materials Engineer. The District Materials Engineer will evaluate the existing source data and any additional data furnished by the contractor for compliance with contract specifications. It is very important that written or verbal approval is not extended to the contractor until complete data is furnished to verify conformance with contract specifications.

If a contractor requests to use a source owned or controlled by ITD, the District Materials Engineer will make necessary arrangements for the contractor to have access to the source for sampling the material and, if necessary, exploratory investigation. The District Materials Engineer will maintain control of the operation of the source and provide the provisions for working and/or reclamation of the source to the contractor. It is the responsibility of the contractor to determine the adequate quantity and substantiate the quality of the material in the source.

The District Materials Engineer prepares the approval/disapproval letter for the District Engineer's signature.

- Sources Not Previously Investigated

The contractor is responsible for furnishing complete data to the Resident/Regional Engineer to indicate that the source meets the contract specification requirements. The District Materials Engineer evaluates all the documentation, including test reports, for compliance and prepares the approval/disapproval letter for the District Engineer's signature.

In all cases, complete documentation must be received before approval is granted for use of the material on a project. The district will provide a copy of the documentation and approval letter to the Central Materials Section.

Refer to [Subsection 106.09](#), Contractor Furnished Source, in the [Contract Administration Manual](#) for administration of source approval.